CLASS 264, PLASTIC AND NONMETALLIC ARTICLE SHAPING OR TREATING: PROCESSES

SECTION I - CLASS DEFINITION

This is a generic class for:

(1) Processes for molding, casting, or shaping of nonmetallic materials to produce articles.

(2) Liquid or melt comminuting of materials other than glass or metal.

(3) Uniting or compacting of bulk or randomly assembled particles.

(4) Furnace Lining or repair.

(5) Melt shaping in the absence of a mold or shaping surface, e.g., spheroidizing of particles.

(6) Working or treatment of nonmetallic materials not otherwise provided for.

GENERAL STATEMENT OF CLASS SUBJECT MATTER

(1) This is a generic class for processes for molding, casting or the plastic shaping, not provided for in any other class, of miscellaneous nonmetallic materials to make or reproduce articles of a definite shape, or the shaping and embossing of sheets of miscellaneous nonmetallic materials, not otherwise provided for.

The common property of plasticity renders molding operations of chief importance in this class.

Where there exists an art class that can properly include all operations preliminary to a broad molding step, such operations, unless otherwise specified will be classified in such class. Where significant molding steps are combined with any other operations, the patents claiming such combinations, unless otherwise provided for will be included in this class and cross-referenced into the other class or classes involved. Note the lines between this class and other classes as set out below.

Where there is no class which could include such operations, the entire preparation of the material is included in this class, but only those are included in which the preliminary operations are performed for the purpose of preparing the material for molding. See the search notes below and the references to other classes for the shaping of specific materials, e.g., paper, sugar, tobacco, etc.

This class will take processes under the class definition, and where not otherwise specifically provided for, in which normally liquid materials are encapsulated. In general, this class will provide for processes in which the covering, encompassing or encasing material is formed or shaped from material in a fluent state.

(2) This is the generic class for processes, not elsewhere provided for, for shaping of material by a comminution or disintegration thereof from a molten or liquid state, wherein the cohesive nature of the material, per se, especially in the comminuted state during solidification thereof influences the shape or configuration of the discrete particles or elements formed. See subclass 5 and the notes thereto for the lines with other classes. For liquid comminution of glass or other vitreous materials and for comminution of liquid metal, see References to Other Classes, below.

(3) The uniting of bulk assembled particulate material either autogenously (see specific references to glass particles and metal particles below) or with added binder or adhesive in a mold or on a shaping surface are included herein, except those processes in which the mold constitutes nothing more than a depository and the particulate material charge is not disclosed to be shaped by said mold or depository prior to heating but changes its bulk shape only on fusion or melting to assume the configuration of said depository. See Lines With Other Classes below, with regard to mold filling or charging.

This class has been made the generic home for methods of compacting and briquetting bulk deposited or handled powdered or particulate matter usually predicated on the production of an interfacial bond between the individual particles. However, see References to Other Classes below for classes that take (1) agglomerating from finely divided solid nonmetallic, inorganic elements, e.g., carbon, wherein no binder, per se, is employed; (2) compacting by mechanical interlock such as results from a baling operation; and (3) mechanical forming of a distilland combined with a thermolytic distilling operation.

This class (264) will accommodate such subject matter only where the resulting compact tends to hold its shape as the result of an interfacial bond between adjacent particles of the mass. Since powder, granules and dust are not characterized by projecting portions which could facilitate a bonding by mechanical interlock, a disclosure or claim restricted to such types of particulate

material is regarded as evidence that the product is rendered self-sustaining by interfacial bonding.

With regard to glass particle uniting, in particular, a patent reciting placing of glass particles other than glass fibers or mineral wool in their final position in a mold, followed by autogenous uniting or sintering or fusion in the configuration or shape imparted by said mold, will be classified in this class (264) whether or not said particles are disclosed to maintain their individual identities to any degree. See References to Other Classes, below, for for processes including a glass working step as therein defined, and for the line where glass fibers or mineral wool are placed onto a mold surface which fibers or mineral wool particles are heated on or subsequent to contact with the surface to fuse the particles with each other.

4) This class will be considered generic to processes for furnace lining formation or repair. (See Subclass References to the Current Class, below.)

5) This class will take shaping of molten materials where no mold or molding surface, per se, is employed, e. g., spheroidizing or rounding of particles, see this class, subclass 15 and the notes thereto.

6) This class will take treatment of nonmetallic materials not otherwise provided for. See the notes to Lines With Other Classes, "Treatment of Shaped Articles," and Subclass References to the Current Class, below. Patents disclosing working, mulling or kneading, per se, of plastic materials will go to this class except where specific materials are recited.

Unless otherwise provided for, the recitation in a claim of a significant molding step will bring a patent to this class. Significant molding operations include named injection molding, centrifugal casting, slush casting, casting of fluids on a forming surface to form a sheet or web, "spinning" into a specifically named bath as set out below, evaporative or solvent extractive "spinning" and combinations of two or more broad molding or shaping steps and other combinations as set out herein.

Such terms as "molding", "casting" (used generically) "extruding", "sheeting" and "forming" are considered to be merely broad or nominal operations for purposes of this class.

The intent must also be considered. If, for example, "extruding" is for discharging material from a chamber in chunks or gobs rather than for shaping, this is not enough for this class.

The production of "shapes" merely suitable for handling or bulk shipping, e.g., "sheets" or "sheeting" of no particular structure will not be considered significant molding in a, per se, operation. Also, where articles identified by name only are produced, a process will not be considered significant for this class unless there are included limitations and/or modifications unique to molding or shaping said named article.

This class will take combinations of broad molding plus preliminary physical or mechanical treatment wherein said treatment is disclosed to perfect the molding.

Patents reciting physical or mechanical treatment subsequent to a broad molding step, e.g., extruding or "spinning" plus stretching, casting with removal of solvent from the cast liquid and heating subsequent to removal of a molded article from the mold to complete cure or to vulcanize, will be placed in this class. Nominal return to ambient temperature is not considered to be an after treatment or a subsequent treatment within the scope outlined here.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

GENERAL LINES

A process including a Class 264 molding step, combined with a separate assembly step, which assembly, if claimed, per se, would be proper for Class 29, is classified in Class 29.

Processes of forming single-crystals combined with simultaneous shaping are provided for in Class 117, except for the molding of non-semiconductor metal materials which are found in Class 164, subclasses 122.1+, also see Class 117 definitions.

A. LINES WITH THE CHEMICAL COMPOSITION CLASSES

(As employed in this section, the term "composition" is intended to include both mixtures of ingredients and compounds, per se, e.g., Classes 106, 208, 252, 423, 424, 520, 585, etc.)

1) Patents limited to process claims reciting a broad or nominal molding step only.

a) Where a composition, per se, is molded and there is

no disclosure as to a chemical reaction being present, the patent will go to this class (264).

b) Where a chemical reaction, mixing or blending of ingredients to form a composition of matter is recited to take place in a mold or during the molding or shaping step, the patent will go to the composition class, even if temperature and pressure conditions are set out.

c) Similarly, where a chemical reaction, mixing or blending of ingredients to form a composition is recited to take place prior to the nominal shaping or molding step, the patent will go to the composition class.

2) Patents containing both composition claims and process claims reciting nominal molding only.

a) Patents containing both claims to a composition and also claims reciting broad or nominal molding of said composition will go with the composition class.

b)Patents containing both claims to a composition and claims reciting broad or nominal molding of said composition wherein there is a chemical reaction, blending or mixing of ingredients of said composition during or prior to the molding step, will go to the composition class, even if temperature or pressure conditions are set out.

c) Where patents contain both claims to a composition and claims reciting a nominal or broad molding of said composition, per se, and there is no disclosure of any chemical reaction taking place, and specific temperature and/or pressure conditions are set out, the patent will go to this class (264).

3) When there is doubt that a chemical reaction, mixing or blending of ingredients takes place, the burden of proof shall rest with this class.

4) When there is a significant molding step in a claim reciting a process for preparation of a composition even where a chemical reaction is set out, the patent will go to this class (264).

5) This class will take patents reciting the “spinning”, e.g., the extruding of a settable material through a shaping orifice into a coagulating bath provided said bath is named or described or at least one ingredient of said bath is set out. Patents claiming only a specific setting bath composition will be classified herein in an appropriate subclass according to the disclosed utility thereof, provided the only disclosed utility for said setting bath composition is for such a purpose. See the notes and search notes to this class (264), subclass 78 with regard to incorporation of a dyeing agent or color producing reactant in the setting bath.

The recitation of “acidic” bath, per se, will not be considered sufficient but setting out of a particular pH or pH range of said “acidic” bath will be deemed significant for this purpose.

6) Where a claim recites treatment, per se, of articles which involves a chemical reaction, e.g., vulcanization or polymerization to final cure, and also includes a particular manipulative or handling step or specific shape retaining or supporting step, the patent will be placed in this class; see subclasses 236 and 347 of this class (264) in particular.

7) Where the treatment, per se, of compositions is a working, kneading or mulling, see the line set out in this class (264) subclass 349.

8) The process of preparing a ceramic or concrete block which includes mixing ingredients, shaping broadly and removal from molds of the shaped bodies followed by firing to fuse or sinter the composition or treatment with steam will go with the appropriate composition, e.g., Class 106, even though a particular temperature or pressure nominally applied is recited. However, the recitation of particular molding conditions or conditions of firing other than temperature or pressure such as, for example, use of an inert atmosphere, would place such process in this class (264). Firing a preform in a controlled atmosphere is appropriate subject matter for this class (264).

Class 106, Compositions: Coating or Plastic, subclasses 39+ takes ceramic compositions, per se, and processes for preparation thereof including firing at specific temperatures for specific time periods. However, this class (264) takes processes of firing a preform under certain conditions, see the line as set out in the notes and search notes to subclasses 603+ of this class (264).

9) See Class 252, Compositions, subclasses 62.51+ and notes thereto for magnetic compositions and methods for preparation thereof which do not include a significant molding step.

10) The line between Class 423, Chemistry of Inorganic Compounds, subclasses 445+ and this class for processes including both molding and carbonizing is as follows: (a) where significant molding occurs prior to a step or steps of carbonizing which make carbon as provided for in Class 423, the process is placed in Class

423, subclasses 445+ unless the process is recited to produce an article of sufficient structure to be classified in a class providing for the structurally defined article (e.g., 428, etc.) in which latter case the process is placed in this class (e.g., molding a fiber with enlarged portions on the ends); and (b) where the molding takes place after carbonizing the line as set forth above in (1) to (6) will apply.

B. MOLD CHARGING OR FILLING

In general, the combination of a mold filling step plus a significant molding step will bring a patent to this class. However, the mere recitation of filling, per se, of a container or a mold with an incidentally hardenable or settable fluent material will not be sufficient to bring a patent into this class, unless the container or mold is set out to have a particular shape or configuration so as to impart said shape or configuration to the enclosed material, particularly when said container or mold is subsequently removed or stripped from the enclosed material. See the definitions and search notes of Class 141, Fluent Material Handling, With Receiver or Receiver Coacting Means, particularly in the Class Definition, section III, (3) and Class 222, Dispensing, sections 8 and 14.

C. GLASS MANUFACTURING

Other than bonding of glass particulate material under conditions as set out above in the definitions on particle uniting, any working of glass type materials in the plastic state including liquid comminuting thereof, pore forming, reshaping, autogenous bonding of glass particles, etc., will be classifiable in Class 65, Glass Manufacturing, and reference is made to the definitions of Class 65 for the line between this class and Class 65.

In general, the following will apply:

A patent disclosing working or treating of named materials for both this class and Class 65 will be classified in this class unless the only claimed species is glass or the only specific example relates to glass in which case the patent will go to Class 65. A patent claiming a combined process for this class and Class 65 will be classified in Class 65.

Class 65 will take formation of filaments and fibers from molten vitreous materials, e.g., glass. However, this class (264) will take processes directed to formation of filaments from siliceous materials in solution, e.g., silicates by precipitation from said solution or evaporation of solvent therefrom.

D. ADHESIVE BONDING

Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, is the residual home for uniting preforms. This class (264) provides for uniting plural preforms under at least one of the following circumstances:

1) At least one of the preforms is reduced to a fluent state in a mold or confined molding space.

2) Joining preforms and simultaneously reshaping the joint by plastic flow.

3) Preforms are united by bonding material in which:

a) the preforms are spaced apart and fluent bonding material is thereafter introduced between them, or

b) fluent bonding material is shaped or retained between spaced preforms by a mold element, or

c) fluent bonding material is shaped and retained between preforms by a preform and has means to maintain a predetermined space between the preforms or

d) the preforms are of porous material, e.g., batts, mats or woven fabric united in a mold and fluent bonding material is used in quantity sufficient to fill the mold cavity and interstices of the porous material.

4) This class (264) provides for uniting running length preforms united in a die under the limitations of A, B, and C above except that if running length strands or webs are bonded and sheathed in a die by a coating operation, i.e., the bonding material is applied at hydrostatic pressure, the method is provided for in Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture.

5) Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, provides for: (a) uniting preforms where one preforms is forced into another preform, as long as both preforms are unaltered in shape other than that which results from displacement of material due to the insertion of the preform. (b) stretching or drawing a self sustaining sheet into contact with a preform body and uniting the contacting surfaces. (c) all tire building processes which include a step of “building” or bringing preformed tire components into assembled relationship.

E. METAL WORKING OR SHAPING

The general line between this class and the metal working or shaping classes will be as follows;

1) Where the claims recite deformation of materials broadly, the disclosure setting out both metals and nonmetals, the patent will go to the appropriate metal working class.

2) Where the claims are limited to deformation of metals only, the patent will go to the appropriate metal working class.

3) Where the claims are limited to deformation or shaping of nonmetals only within the class definition, the patent will go to this class (264).

4) Where there is a claim drawn to a metal and an equally comprehensive and mutually exclusive claim drawn to a nonmetal only, the patent will go to the appropriate metal working class.

5) Where deformation of both a metal and a nonmetal are included in the same claim, the patent will go to the appropriate metal working class, e.g., Class 29, Metal Working, depending on the claim as set out, with plural diverse operations generally going to Class 29.

6) Where the claim is broad or nondefinitive as to material, the patent will go to the appropriate metal working class, as stated above, and this will include disclosures of deforming: (A) A laminate of a metal with a nonmetal; (B) A "composite material" such as a metal - nonmetal article or workpiece except where by disclosure only the nonmetal component is deformed or shaped.

7) Where a process as set out above and not otherwise coming to this class is concerned and which involves plural diverse operations, the patent will go to Class 29 or a successor class except where subordinate classes could provide for certain diverse operations.

8) Where a patent recites casting or shaping of metal mold together with the use of said mold in shaping materials, e.g., synthetic resins, the combination will be considered classifiable in this class (264).

F. COATING

1) Coating, per se, Processes of coating, per se, are classified in Class 427, Coating Processes, if not more specifically provided for elsewhere. Two species of coating, per se, are provided for in this class (264). (1) Furnace lining formation or repair by a coating process is provided for in Class 264, subclass 30. (2) The formation of pipe coating by troweling is provided for in Class 264, appropriate subclasses.

2) Coating and Shaping Distinguished Processes of coating, per se, may be distinguished from processes of shaping, per se, by application of the following guides:

a) The claimed process of applying a fluent material to a self-sustaining body supported by a disclosure that upon setting of the fluent material the self-sustaining body is to be separated (e.g., stripped) therefrom to form from said fluent material an article intended for subsequent use, is considered shaping and not coating. In the absence of any clear disclosure of separating the process constitutes coating, per se. A claimed process directed to contacting a base with a fluent material but supported by a disclosure of both stripping and nonstripping is originally classified as directed to a process of coating, per se, and is cross-referenced to this class (264). Contacting a base with a fluent material combined with the claimed step of stripping is a shaping process.

b) The process of applying a fluent material to a self-sustaining base in which the extent of lateral displacement of the fluent material is determined by a dam or retaining wall is considered shaping and not coating. The retaining wall may either unite with the fluent material to form a composite article or may be independent of the article formed. The application of fluent material to a base uniting therewith to form a layered article which base is of such configuration that it could serve as a retaining wall but does not actually so function, is considered a process of coating and not shaping.

c) The line with regard to shaping a layer of material about an indefinite length preform as it advances through a shaping orifice is as follows: Class 264 provides for advancing a preform through an orifice and simultaneously and positively forcing shaping material through said orifice so as to shape the material around the preform as it issues from the orifice. Class 427 provides for drawing a preform through a coating material and then through a shaping orifice to shape the coating material adhering to the preform.

d) Where a patent contains a claim for a process, of Class 264 and an equally comprehensive claim of Class 427 the patent shall be assigned to Class 427 and cross referenced to Class 264.

3) Coating and Shaping Combined.

a) Processes including shaping or molding followed by a significant coating procedure where the mere fact of molding or shaping a body is claimed are construed as processes of coating previously shaped bodies and are classified as processes of coating, per se.

b) Processes of forming pipe coatings combined with troweling are included in this class (264).

c) See this class (264), subclass 129, Note (1), for a discussion of shaping and coating combinations not included in a) or b).

4) Coating and Firing Combined Processes including the combination of firing and coating, regardless of the sequence of the respective steps, are classified in Class 427.

G. ARTICLES

This class does not take patents having article claims. Specific articles are classified with the respective arts to which they apply. Articles of specific configuration or structure produced by methods of this class, of plastic materials within the class definition, and of no particular art used or form which would be otherwise classified, e.g., stock materials, are provided for in Class 428 Stock Material or Miscellaneous Articles. Articles of no significant structure, identifiable otherwise by the chemical structure, identifiable otherwise by the chemical structure or composition thereof, per se, are classifiable with the compound or composition. Composite articles produced by the methods of this class may be analogous in structure to those produced by coating or laminating procedures and Class 428, Stock Material or Miscellaneous Articles, is pertinent thereto.

H. TREATMENT OF SHAPED ARTICLES

This class will take miscellaneous treatments, per se, of shaped nonmetallic articles unless said treatment is otherwise provided for in a proper functional art class. See this class (264) subclass 340 and the notes and search notes thereto and to the indented subclasses.

I. FOR PROCESSES OF MOLDING OR SHAPING OTHER SPECIFIC ARTICLES OR MATERIALS IN CLASSES NOT SET OUT ABOVE, MISCELLANEOUS SEARCH NOTES, AND INDEX TO CLASSES REFERRED TO ABOVE:

See References to Other Classes, below.

J. HAZARDOUS OR TOXIC WASTE CONTAINMENT

See References to Other Classes, below.

K. CLATHRATES AND INTERCALATES

Clathrates and intercalates (inclusion compounds), per se, are classified hierarchically and subject to the limitations set forth in the compound (element) classes based both on the encapsulant and encapsulate. For example, a clathrate of urea and hydrogen peroxide is classified in Class 564, subclass 32, urea and an organic compound in Class 564, subclass 1.5, dextran and iodine in Class 536, subclass 112, etc. Where a patent does not state that a material is either a clathrate or an intercalate, the assumption is made that the material is either a coated or encapsulated product classified in Class 428, subclasses 402+.

SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS

SEE OR SEARCH THIS CLASS, SUBCLASS:

30, see the notes and search notes for classes which provide for furnaces and furnace lining.

103, for processes under the class definition which include a step of twining, braiding, plying or twisting multiple elements about each other or the step of textile fabric formation.

232+, 340+ and 349, see the notes for treatment of nonmetallic materials not otherwise provided for. See particularly the notes to subclass 349 for patents disclosing working, mulling or kneading, per se, of plastic materials will go to this class except where specific materials are recited.

SECTION IV - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

12, Boot and Shoe Making, for the making of shoes from preformed sheets or blanks and processes of making shoes involving one or more of the following operations recited broadly; molding, casting, vulcanizing.

19, Textiles: Fiber Preparation, subclasses 144+ as the generic home for bringing fibers together either with relation to each other or with some other material.

23, Chemistry: Analytical and Physical Processes, subclasses 313+ take agglomerating from finely divided solid nonmetallic, inorganic elements, e.g., carbon, wherein no binder, per se, is employed.

26, Textiles: Cloth Finishing, subclasses 71+ for apparatus for stretching a running web of natural or synthetic cloth.

28, Textiles: Manufacturing, subclasses 118+ and 121 for making tampons or wads of compacted material.

29, Metal Working, Lines With Other Classes, "Metal Working or Shaping," above.

34, Drying and Gas or Vapor Contact With Solids, for processes of drying of organic and inorganic plastic materials, per se. Generally the combination of forming by a Class 264 operation and drying is classified in Class 264 except where a filament is formed by a spinning operation which is not significantly claimed and the product dried in a significantly claimed manner, which operation is provided for in Class 34.

44, Fuel and Related Compositions, subclasses 550+ for a solid fuel consolidation or shaping process which goes beyond mere molding of a starting composition, especially subclasses 596+ for a process which includes pressing using a specified condition or technique.

51, Abrasive Tool Making Process, Material, or Composition, for a process of forming an abrasive tool.

52, Static Structures (e.g., Buildings), for various molding processes there provided for and see the notes to subclass 31 of Class 264 for the line between these classes.

53, Package Making, subclasses 452+ for processes of shaping preformed material to form a receptacle and subsequently filling. This class (264) provides for processes wherein a cover material, i.e., primary encompassing or encasing material, is shaped from a material in a fluent or nonpreformed plastic state preliminarily to or simultaneously with a packaging operation; where a laminating step, e.g., cut seaming, is included in any stage of this indicated procedure, the process is provided for in Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture. The formation of cover adjuncts, as defined in that class (53), by a molding operation is provided for Class 53, subclasses 410+ (in particular, see subclass 423).

57, Textiles: Spinning, Twisting, and Twining, subclass 362 for twining and twisting of filaments and fibers, per se. See Subclass References to the Current Class, above.

62, Refrigeration, for processes involving solidifying a fluid by cooling and molding which are peculiar to forming an ice (H2O or CO2) product and utilizing a liquid as the raw material. See this class, subclass 604 for other molding processes including a step of cooling the molded material to below 0°C.

65, Glass Manufacturing, for liquid comminution of glass or other vitreous materials, and for processes including a glass working step as therein defined, and Lines With Other Classes and Within This Class in Class 65 for the line where glass fibers or mineral wool are placed onto a mold surface which fibers or mineral wool particles are heated on or subsequent to contact with the surface to fuse the particles with each other.

69, Leather Manufactures, for processes of embossing and shaping leather.

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 331+ for comminution of liquid metal.

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, for pertinent subclass (es) as determined by schedule rewiew.

76, Metal Tools and Implements, Making, subclasses 101.1+ for processes which may include a plastic working step.

79, Button Making, for processes there provided for which may include a plastic molding step.

83, Cutting, for processes of, per se, cutting, severing, or incising. Cutting of a material with reshaping flow of the material is provided for in this class (264); although a disclosure of an inherent flow of material in the act of cutting, is not considered sufficient shaping for inclusion in this class. See the notes to Class 83, Class Definition, B, Cutting of green ceramic, earthenware, or cemetitious preformed material, with or without reshaping the material, is provided for in this class (264).

100, Presses, subclasses 35+ for processes for compressing various materials there provided for to form compacts of smaller volume. The shaping of materials to produce articles by molecular flow is generically in this class (264) where

the materials are nonmetallic. Class 100 takes compacting by mechanical interlock, such as a bailing operation.

100, Presses, subclasses 35+ takes compacting by mechanical interlock such as results from a baling operation.

101, Printing, subclasses 17 and 32 for processes for producing characters or designs by means of printing dies adapted to deform the material.

106, Compositions: Coating or Plastic, see Lines With Other Classes and Within This Class, "Lines With the Chemical Composition Classes" section 8.

127, Sugar, Starch, and Carbohydrates, subclass 59 for processes directed to be crystallization of sugar in molds.

131, Tobacco, appropriate subclasses, for shaping tobacco products and see especially subclasses 77+ for processes for molding or otherwise forming tobacco in the manufacture of cigarettes and cigars.

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, Lines With Other Classes and Within This Class, "Mold Charging or Filling."

144, Woodworking, subclass 358 for processes for impressing, indenting or raising-in-relief for ornamentation of wood materials, and subclasses 349 and 381 for processes for bending wood.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, see Lines With Other Classes and Within This Class, Adhesive Bonding, above.

162, Paper Making and Fiber Liberation, for processes of forming an interfelted fibrous product by deposition from a liquid suspension and also processes of fiber liberation. Shaping or reshaping of a fibrous water laid product which is still wet from the forming operation is provided for in Class 162, while rewetting a dried product before reshaping or shaping dry to form a noncommercial product is in Class 264. Processes wherein destruction of the product of a Class 162 forming operations are found in Class 264. Chemically liberating, purifying or recovering fibers followed by a Class 264 shaping operation is found in Class 264.

164, Metal Founding, subclass 6 for processes of making mold, generally of sand, to be used in a metal casting operation and subclasses 47+ for metal casting operation. Class 164, subclasses 91+ provide for processes of casting metal around a nonmetallic body. That class (164) also provides for a Class 264 operation followed by a Class 164 step.

166, Wells, subclasses 285+ for processes of cementing a well.

201, Distillation: Processes, Thermolytic, subclasses 5+ take mechanical forming of a distilland combined with a thermolytic distilling operation.

204, Chemistry: Electrical and Wave Energy, processes involving an application of electrical or wave energy to effect a chemical reaction, per se, and also processes involving electrophoresis.

208, Mineral Oils: Processes and Products, see Lines With Other Classes, "Lines With the Chemical Composition Classes" above.

216, Etching a Substrate: Processes, Lines With Other Classes, Chemical Manufactures, Part A, paragraph 2 for detailed line between this Class 264 and Class 216.

222, Dispensing, see Lines With Other Classes, "Mold Charging and Filling" above.

242, Winding, Tensioning, or Guiding, for coiling or uncoiling an elongated material to or from storage, or for making a definite length article.

249, Static Molds, appropriate subclasses, for static molding apparatus.

252, Compositions, see Lines With Other Classes and Within This Class, "Lines With the Chemical Composition Classes" 9.

260, Chemistry of Carbon Compounds, see Lines With Other Classes and Within This Class, "Lines With the Chemical Composition Classes" above.

366, Agitating, subclasses 69+ for the method of working and kneading of rubber or heavy plastic. Such working or kneading combined with shaping or treating steps is provided for in Class 264.

404, Road Structure, Process, or Apparatus, subclasses 72+ for a road making process which may include a molding step. See Class 264, subclass 31 for the line between Classes 264 and 404.

423, Chemistry of Inorganic Compounds, see Lines With Other Classes and Within This Class, "Lines With the Chemical Composition Classes" above.

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 1.11+, 2+, 40+, and 400+ for class defined compositions and methods comprising shaped or special form structures. Also note discussion in the class definition for Class 264 in Lines With Other Classes and

Within This Class, “Lines With the Chemical Composition Classes” above.

426, Food or Edible Material: Processes, Compositions, and Products, appropriate subclasses, especially subclasses 276+, 279+, 297, 337, 414, and 512+ for processes involving the molding or shaping edible material.

428, Stock Material or Miscellaneous Articles, Lines With Other Classes and Within This Class, “Articles.” above.

432, Heating, subclass 13 for a residual process for the melting, per se, of solid material.

433, Dentistry, subclass 214 for processes for taking impressions in the mouth which may include a molding step.

434, Education and Demonstration, subclasses 81+ for processes for teaching sculpturing there provided for which may include a molding step.

493, Manufacturing Container or Tube From Paper; or Other Manufacturing From a Sheet or Web, for combined operations in the manufacture of an article of commerce from paper or other sheet or web material and particularly subclasses 395+ for bending of a sheet or web without thinning or thickening flow of the material.

505, Superconductor Technology: Apparatus, Material, Process, subclasses 300+ for processes of producing high temperature (T_c > 30 K) superconductors; particularly subclass 401 for shock processing, subclass 412 for laser ablative removal, subclass 425 for shaping particulate by spraying, dropping, or slinging of solution, suspension, or melt; or subclasses 490+ for shaping, consolidating, or sintering processes.

520, Synthetic Resins or Natural Rubbers, see Lines With Other Classes and Within This Class, “Lines With the Chemical Composition Classes” above.

585, Chemistry of Hydrocarbon Compounds, see Lines With Other Classes and Within This Class, “Lines With the Chemical Composition Classes” above.

588, Hazardous or Toxic Waste Destruction or Containment, subclasses 249+ for the containment of hazardous or toxic waste by molding or shaping.

SECTION V - GLOSSARY

BATT

A term of art for a web or sheet of material generally formed by random interfelting of mass deposited discrete fibers or from tangled or matted filaments, e.g., cotton batting.

BENDING

Distorting or deforming of a workpiece or self sustaining body by curving or moving a portion thereof through its entire thickness relative to another portion during which the thickness thereof remains substantially the same and no significant plastic flow occurs.

CASTING

A process of molding or forming wherein impressions are made with fluent or molten materials as by pouring into a mold with hardening or setting of said material in said mold.

EXTRUDANT

A shaped body of material formed by forcing a supply of said material through a confining orifice whereby the cross-sectional area of the extruded portion corresponds to the dimensions of the orifice.

FIBER

A discrete particle, generally bulk or mass handled because of its small size, wherein the particle has a length considerably greater than its breadth or cross-sectional diameter.

INDEFINITE LENGTH WORK

A self sustaining body, which because of its relatively large length is handled at a point intermediate of its ends, and includes single or one piece bodies formed in a continuous manner.

PREFORM

An article or stock material or bland which is self sustaining and which may be subjected to a shaping or reshaping operation.

RESHAPING

A process in which a self sustaining body or a preform is subjected to a deforming, e.g., by plastic flow, bending, stretching, twisting, corrugating, so as to alter its overall shape.

SPINNING

A molding operation for forming of continuous or indefinite length articles, generally filaments, by extrusion through an appropriately sized orifice. Some types of spinning are spinning into a reactive bath, melt spinning, evaporative spinning or solvent-extractive spinning.

TREATMENT

A physical, chemical or mechanical step applied to molding material or an article or preform, (see conditioning).

SUBCLASSES

.5 SHAPING OR TREATING RADIOACTIVE MATERIAL (E.G., FISSIONABLE OR FERTILE, ETC.):
This subclass is indented under the class definition. Processes directed to molding or treating articles having a composition including a radioactive ingredient.

(1) Note. Included herein for example are fissionable and fertile ingredients, inclusive of nuclear reactor fuel, breeder or blanket materials. See the glossary in the definitions of Class 376, Induced Nuclear Reactions: Processes, Systems, and Elements, for definitions of these terms.

(2) Note. See the definitions of this class for the line between this class and such composition Classes as 106, Compositions: Coating or Plastic and 252, Compositions.

SEE OR SEARCH CLASS:
75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclass 235 for a consolidated metal particle composition containing oxide of an Activide.
252, Compositions, subclasses 625+ for radioactive compositions and miscellaneous methods of treating same.
376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 409+ for nuclear fuel component structures including radioactive materials; and subclasses 900+ for cross-reference art collections of particular materials or material shapes for fission reactors.
419, Powder Metallurgy Processes, appropriate subclasses for powder metallurgy methods of making nuclear fuel elements or charges.
427, Coating Processes, subclass 5 for coating processes wherein the base or coating is radioactive.
428, Stock Material or Miscellaneous Articles, appropriate subclasses, especially subclasses 411+ for a composite web or sheet characterized merely by the composition of the layers, in which one of the layers may be a radioactive material.

1.1 OPTICAL ARTICLE SHAPING OR TREATING:
This subclass is indented under the class definition. Processes directed to forming articles capable of producing an optical effect other than mere transparency or planar reflection.

(1) Note. The effect may be of (a) substantially total divergence, convergence or internal reflection of light rays passing through or directed at said articles, or (b) transmitting or reflecting light rays vibrating in one plane only, e.g., polarized light, said articles having a desired contour, shape, internal molecular arrangement, or of a specific composition necessary to bring about said optical effects.

(2) Note. This subclass provides for a process in which a nonoptical article is molded against an optical article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
73+, and 108+, for producing articles having nacreous or pearlescent surface effects.
322, for a process of preliminary softening of a workpiece and then applying heat and/or pressure to the workpiece to

form a curvilinear article which has the shape of a lens.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclasses 37+ for processes within the class definition for lens making.

359, Optical: Systems and Elements, appropriate subclasses for optical elements, per se.

428, Stock Material or Miscellaneous Articles, appropriate subclasses for a stock material product or article having light-transmitting properties; especially subclass 34 for a product having spaced, gas-enclosing, light-transmissive sheets sealed at their edges; subclass 38 for an article having a light-transmissive or translucent mass with an opaque border or frame; and subclasses 426+ for a nonstructural composite web or sheet including a layer comprising glass.

1.21 Nonresinous material only (e.g., ceramic, etc.):

This subclass is indented under subclass 1.1. Processes directed to shaping or treating an optical article which is composed solely of nonresinous material.

(1) Note. The application of a nonresinous coating to an optical article is not provided for here. Such subject matter is provided for in subclasses below.

(2) Note. Attention is directed to the definition of Class 520, Synthetic Resins or Natural Rubbers, for the distinction between the terms “resinous” and “nonresinous.”

SEE OR SEARCH THIS CLASS, SUBCLASS:

1.7, for processes which include the application of a nonresinous coating to an optical article.

1.22 Scandium (Sc), yttrium (Y), or rare earth containing (i.e., atomic numbers 21, 39, or 57-72):

This subclass is indented under subclass 1.21. Processes wherein the nonresinous material contains scandium, yttrium, or a rare earth.

(1) Note. The rare earths are: Lanthanum (La); Cerium (Ce); Praseodymium (Pr); Neodymium (Nd); Promethium (Pm); Samarium (Sm); Europium (Eu); Gadolinium (Gd); Terbium (Tb); Dysprosium (Dy); Holmium (Ho); Erbium (Er); Thulium (Tm); Ytterbium (Yb); Lutetium (Lu).

1.23 Halogen containing:

This subclass is indented under subclass 1.21. Processes wherein the nonresinous material contains a halogen, atomic numbers 9, 17, 35, 53, and 85 listed on the periodic table.

(1) Note. The halogens are: Fluorine (F); Chlorine (Cl); Bromine (Br); Iodine (I); Astatine (At).

1.24 Optical fiber, waveguide, or preform:

This subclass is indented under subclass 1.1. Processes directed to shaping or treating an optical fiber, waveguide, or preform.

(1) Note. Optical fibers are considered light guidance systems that are generally cylindrical in shape. The fibers rely upon modal transmission to transmit light along their axial length.

(2) Note. A waveguide is considered a thin dielectric guide film of high refractive index formed adjacent to a substrate or support region of lower refractive index. The thin-film relies upon modal transmission to transmit light along its length.

1.25 Forming connector or coupler (e.g., fiber link, etc.):

This subclass is indented under subclass 1.24. Processes including joining at least two optical fibers, waveguides, or preforms by producing, shaping, or treating an interface element or producing, shaping, or treating coverings or clads surrounding the optical fiber, waveguide, or preform joining site.

(1) Note. The interchange of light radiation between optical fibers or waveguide structures having a mechanical interconnection (coupler or connector) at the end of or between structures by a process of

this class is properly classified in this subclass.

(2) Note. Shaping and treating processes including joining or connecting optical fibers, waveguides, or preforms by fusion (e.g., forming optical fiber bundle) are proper for this subclass. Processes of forming a cable or fiber bundle without fiber or waveguide joining, connecting, coupling, or fusing are found below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

1.28, for processes of forming cables or fiber bundles.

1.26 Having lens integral with fiber:

This subclass is indented under subclass 1.25. Processes wherein the optical product formed has an optical component which focuses transmitting light waves, joined directly to at least one light transmitting fiber.

1.27 Utilizing plasma, electric, electromagnetic, particle, or wave energy:

This subclass is indented under subclass 1.24. Processes wherein plasma, electric, electromagnetic, particulate, or wave energy is used to treat or shape the optical fiber, waveguide, or preform.

(1) Note. The wave energy used may be light, sonic, supersonic, ultrasonic, gamma rays, infrared rays, X-rays, etc. Particulate energy includes charged particles and atomic emissions, such as alpha rays, beta rays, and neutrons.

(2) Note. The energy must be applied as such directly to the work. Conversion or electrical energy to heat and the application of the heat to the work is excluded from this subclass and is provided for in appropriate subclasses below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10, for processes of comminuting a liquid by electrical energy.

275+, for a process of molding wherein magnetic or electrostatic field or force is utilized to maintain a preform in a selected position during molding, and see (1) Note above.

405+, for process including the application of electrical or wave energy to work in general.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 272.2+ for a laminating process including direct application of electrical or radiant energy to the work, and see the SEARCH CLASS notes thereunder.

201, Distillation: Processes, Thermolytic, subclasses 5+ for a thermolytic distillation process combined with a shaping operation in which electrical energy is applied to the work; and subclass 19 for a thermolytic distillation process in which electrical energy is applied to the work.

204, Chemistry: Electrical and Wave Energy, subclasses 155+, 157.15+, and 164 for processes of effecting a chemical reaction by using electrical or wave energy. The line stated in the class definition of Class 204, above the definition “Notes” therein, for claims defining a Class 204 operation combined with an operation for another class is to be followed for classification of claims defining both Class 204 and Class 264 operations.

520, Synthetic Resins or Natural Rubbers, particularly Class 522 for a process of preparing or treating a synthetic resin or natural rubber involving a chemical reaction brought about by application of wave energy.

1.28 Forming fiber bundle or cable (e.g., covering, sheath, etc.):

This subclass is indented under subclass 1.24. Processes wherein at least two optical fibers or waveguides are incorporated into an assembly (a) that provides tensile strength and external protection or (b) are adjacent one another to guide light collectively.

(1) Note. Extrusion processes involving forming a cable or fiber bundle are properly classified here. Extrusion processes

involving a single (individual) optical fiber or waveguide are classified below.

(2) Note. Processes of forming or treating cables or fiber bundles wherein optical fibers or waveguides are (a) embedded in a matrix, (b) placed in separate preformed grooves or cavities, (c) sheathed, or (d) fastened adjacent one to another are proper for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

1.29, for extrusion processes involving forming coating, core, or clad for individual (single) optical fibers or waveguides.

1.29 Extruding (i.e., die):

This subclass is indented under subclass 1.24. Processes wherein the optical fiber, waveguide, or preform is formed or treated by causing a positive force or pressure to push glass through a die (e.g., core, clad, or sheath, etc.).

(1) Note. Coextrusion processes involving treating or forming optical fibers, waveguides, or fiber preforms are properly classified here.

1.31 Light polarizing article or holographic article:

This subclass is indented under subclass 1.1. Processes directed to (a) aligning or orienting the molecular or structural composition of a plastic material to produce an article or coated article that allows light to pass therethrough in a single plane or (b) a holographic article, or otherwise testing said article.

SEE OR SEARCH THIS CLASS, SUBCLASS:

108, for a process of orienting particles in a fluent matrix material.

288.4+, and 291+, for processes of stretching to impart bifringence properties to articles.

437+, for a process of orienting particles by directly applying electrical energy to the particles

SEE OR SEARCH CLASS:

356, Optics: Measuring and Testing , subclass 457 for holographic interferometry in general.

359, Optical Systems and Elements, subclasses 1+ for holographic systems or elements, per se, subclasses 3+ for particular recording medium, and subclasses 383+ for polarizers, per se, or use of polarized light.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 1 for a process of making a hologram or the composition therefor.

1.32 Lens:

This subclass is indented under subclass 1.31. Processes wherein the polarizing article is a lens or a lens coated with polarizing material.

(1) Note. Treatment by encapsulation of polarizing material is included in this subclass.

(2) Note. The coating material may be responsible for the polarization.

1.33 Optical recording medium:

This subclass is indented under subclass 1.31. Processes wherein the light polarizing article or holographic article is used as a medium to record data or information.

(1) Note. An optical recording medium in the form of tape, card, or disc is included in this subclass.

(2) Note. An optical recording medium combined with the capability of reproducing recorded information or optical memory medium, per se, is properly classified in this subclass.

1.34 Film or sheet:

This subclass is indented under subclass 1.31. Processes wherein the light polarizing article or holographic article is (a) in the form of a film or sheet or (b) a layered product having said film or sheet as one of the layers.

(1) Note. For classification in this subclass a sheet or film will be considered a por-

tion of material of finite length, whose width is greater than its thickness and which may be of any geometric shape (e.g., triangle, circle, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:

1.33, for processes wherein the light polarizing or holographic article in the form of a sheet or film is used as an optical recording or reproducing medium.

1.35 Halogen containing:

This subclass is indented under subclass 1.34. Processes wherein a composition of the film or sheet contains halogen or is coated or treated with a halogen containing material.

1.36 Utilizing plasma, electric, electromagnetic, particulate, or wave energy:

This subclass is indented under subclass 1.1. Processes wherein plasma, electric, electromagnetic, particulate, or wave energy is used to treat or shape the optical article.

(1) Note. The energy used may be light, sonic, supersonic, ultrasonic, gamma rays, infrared rays, X-rays, etc. Particulate energy includes charged particles and atomic emissions, such as alpha rays, beta rays, and neutrons. The mere use of magnetic force employed to maintain a preform in a selected position is not provided for here, for which see subclasses 275+ below.

(2) Note. The energy must be applied as such directly to the work. Conversion of electrical energy to heat and the application of the heat to the work is excluded from this subclass and is provided for in appropriate subclasses below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

10, for processes of comminuting a liquid by electrical energy.

275+, for a process of molding wherein magnetic or electrostatic field or force is utilized to maintain a preform in a selected position during molding, and see (1) Note above.

405+, for process including the application of electrical or wave energy to work in general.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 272.2+ for a laminating process including direct application of electrical or radiant energy to the work, and see the SEARCH CLASS notes thereunder.

201, Distillation: Processes, Thermolytic, subclasses 5+ for a thermolytic distillation process combined with a shaping operation in which electrical energy is applied to the work; and subclass 19 for a thermolytic distillation process in which electrical energy is applied to the work.

204, Chemistry: Electrical and Wave Energy, appropriate subclasses for processes effecting a chemical reaction by utilizing electrical or wave energy. The line stated in the Class 204 definition for claims defining a Class 204 operation combined with an operation for another class is to be followed for classification of claims defining both Class 204 and Class 264 operations.

520, Synthetic Resins or Natural Rubbers, particularly Class 522 for a process of preparing or treating a synthetic resin or natural rubber involving a chemical reaction brought about by application of wave energy.

1.37 Laser utilized:

This subclass is indented under subclass 1.36. Processes wherein the electromagnetic energy used is laser.

(1) Note. Lasers are considered to be a narrow beam of light (light amplified by stimulated emissions of radiation).

(2) Note. Processes wherein a laser measured in the ultraviolet range are properly classified in this subclass.

1.38 Ultraviolet light utilized:
This subclass is indented under subclass 1.36. Processes wherein the electromagnetic energy used is ultraviolet light.

1.6 Continuous or indefinite length:
This subclass is indented under subclass 1.1. Processes directed to the shaping or treating of an optical article which is continuous or of indefinite length.

1.7 Composite or multiple layer:
This subclass is indented under subclass 1.1. Processes directed to shaping or treating an optical article including incorporation of an optical preform into the final optical article.

(1) Note. This and the indented subclasses provide for molding a lens in two different sections where the first section has the second molded against it as well as processes in which the second section completely covers the first.

(2) Note. Chemical treatment of an optical preform to alter optical properties of part of the preform are not provided for herein, and are found in subclass 2.6.

1.8 Including bifocal:
This subclass is indented under subclass 1.7. Process directed to forming an optical article having multiple nonrandom areas of uniform refractive properties which differ from each other.

(1) Note. This subclass provides for the forming of bifocals in particular and multifocal lenses in general.

1.9 Reflective:
This subclass is indented under subclass 1.7. Processes directed to producing a reflective article.

2.1 Rotational molding:
This subclass is indented under subclass 1.1. Processes in which rotating motion is imparted to the material being shaped or to the mold or mold-shaping surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8, for formation of particulate material from a liquid or molten mass by means of centrifugal force.

68, for rotation to produce frictional heat.

69+, for processes which pertain to agitating by plural sequential rotations in reverse directions; however, such patents should be crossed herein where applicable, depending on the time of duration of said rotation periods in one direction.

114, for use of centrifugal force in formation of articles by uniting of bulk assembled particles.

175, for processes of forming indefinite length articles by a calendering operation between endless shaping surfaces, e.g., belts or wheels.

176, for centrifugal spinning of filament or fibers.

270, for processes of lining a mold cavity employing centrifugal force.

310, for processes of rotational molding.

SEE OR SEARCH CLASS:

164, Metal Founding, subclasses 114+ for processes of centrifugally casting metals.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 425+ for a molding machine utilizing mold motion to distribute or compact a fluent material in a mold.

2.2 Changing mold size or shape during molding or with shrinkage compensation:
This subclass is indented under subclass 1.1. Processes in which the volume or morphology of the mold cavity is altered during the molding process or in which some expedient is utilized which is claimed or disclosed as compensating for the shrinkage of the material to be shaped.

2.3 With mold adherence or release:
This subclass is indented under subclass 2.2. Processes in which materials or conditions are chosen such that the adherence of the molding material to the mold is facilitated or a specific method of release of the optical article or the use of a named release agent is claimed.

2.4 Preform:

This subclass is indented under subclass 2.2. Processes directed to the reshaping of a preform into an optical article or the treatment of such preform.

2.5 Including step of mold making:

This subclass is indented under subclass 1.1. Processes which include the step of producing (a) a shaping or molding device either as a, per se, operation by a method within the definitions of this class, or (b) in combination with a step of employing said shaping or molding device in the production of a molded product by a process classifiable in this class, in which latter instance the molding or shaping device may be formed by methods provided for elsewhere.

(1) Note. Patents reciting merely the application or formation of mold linings on molding surfaces are not within the scope of this subclass and are classified on some other bases.

(2) Note. Patents reciting processes for manufacturing or assembling molds not specifically provided for herein are classified in various other classes depending on the specific manufacturing step employed, e.g., Class 29, Metal Working; Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

31+, for processes of erecting molds and casting structural installations in situ.

219+, for processes not forming an optical article which involve the step of making the mold used.

337+, for processes which employ specific mold materials or specific mold coatings or linings.

SEE OR SEARCH CLASS:

164, Metal Founding, subclasses 6+ for processes of making molds under the class definition.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclasses 69 and 70 for processes of electroforming printing plates, molds and the like.

2.6 Nonmechanical aftertreatment (e.g., hydration of contact lens, extraction, heat treatment, etc.):

This subclass is indented under subclass 1.1. Processes directed to the treatment of an optical article by means other than mechanical shaping.

(1) Note. This subclass includes most hydrophilic contact lenses.

2.7 Reshaping or treatment of an optical preform:

This subclass is indented under subclass 1.1. Processes directed to the mechanical shaping or treatment of an optical preform.

3.1 EXPLOSIVE OR PROPELLANT ARTICLE SHAPING OR TREATING:

This subclass is indented under the class definition. Processes in which the material which is shaped or molded is disclosed to have utility as an explosive or a propellant.

SEE OR SEARCH CLASS:

86, Ammunition and Explosive-Charge Making, subclasses 20+ for the loading of fireworks or bursting charges with explosive or propellant material.

149, Explosive and Thermic Compositions or Charges, subclasses 2+ for explosive compositions shapes, nominal container shapes therefore etc. Also see “SEARCH CLASS”, under subclass 2 of that class for related fields of search for shaped inflammable compositions. For explosive compositions, per se, search appropriate subclasses of that class.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 98+ for colloid systems of continuous or semicontinuous solid phase with discontinuous liquid phase (gels, pastes, flocs, coagulates) or agents for such systems or

making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

3.2 Rolling to form sheet or rod:
This subclass is indented under subclass 3.1. Subject matter wherein the material is rolled into the form of sheet or rod.

3.3 Extrusion to form sheet or rod:
This subclass is indented under subclass 3.1. Subject matter the material is extruded to form sheet or rod like shapes.

3.4 Forming or treating particulate material:
This subclass is indented under subclass 3.1. Subject matter wherein the material is shaped in form of particulate matter, e.g., pellets, flakes, etc.

3.5 By liquid comminuting:
This subclass is indented under subclass 3.4. Subject matter wherein the particulate material if formed directly from a liquid state commonly referred to as liquid comminution and solidification.

3.6 Immersed in liquid:
This subclass is indented under subclass 3.4. Subject matter wherein the comminution is carried out beneath the surface of liquid.

4 ENCAPSULATING NORMALLY LIQUID MATERIAL:
This subclass is indented under the class definition. Processes wherein a material which is normally liquid at ambient temperature and pressure is encapsulated, i.e., packaged or contained, in shaped discrete receptacles e.g., microspheres.

(1) Note. The classification of a patent reciting the encapsulation of a core material with no reference to the core being a solid or liquid, the assumption is made that the core is solid and therefore classified in Class 427, subclasses 213.3+ as an original with a suggested cross to this class, subclass.

(2) Note. This class, subclass 4.1 provides for processes of producing a composition by way of encapsulating (shaping operation) a liquid core where elsewhere not provided for. The liquid core may be homogeneous or heterogeneous.

(3) Note. A patent reciting a coated or encapsulated material with claimed utility(ies) is classified with the composition classes. A similar patent with (a) multiply disclosed utilities or (b) undisclosed utility is classified in Class 428, subclasses 402+. However, in the latter two cases (a) and (b) above, when the coating or encapsulating material stabilizes a compound against physical or chemical degradation, then classification is appropriate for and subject to the limitations set forth in one of the compound (element) classes. The order of superiority of the composition classes are listed below under "SEARCH CLASS". Those classes with an asterisk are not composition classes but deemed appropriate for further search.

(4) Note. Clathrates and intercalates (inclusion compounds), per se, are classified hierarchically and subject to the limitations set forth in the compound (element) classes based both on the encapsulant and encapsulate. See the main definition for Class 264, section II, LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, subsection K, CLATHRATES AND INTERCALATES, for examples.

SEE OR SEARCH CLASS:
8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 526 for a dye in specified form other than mere powder.
29, Metal Working, subclass 422 for processes of shaping a container end to encapsulate material.*
53, Package Making, appropriate subclasses for encapsulating processes employing a preformed planar sheet or a tube in package making.*
75, Specialized Metallurgical Processes, Compositions for Use Therein, Con-

solidated Metal Powder Compositions and Loose Metal Particulate Mixtures, for pertinent subclass (es) as determined by schedule rewiew.

106, Compositions: Coating or Plastic, for a filler or pigment for a coating composition which may include size or structure of the constituent particles or fibers which recitation does not serve to exclude from Class 106. See especially subclass 21 (invisible inks), 36, 235, 241, 251, 253+, 266, 272, 275, 276, 280, 281+, 400+, 400+, 636, 734, and 816 (coated material) in Class 106. See also V, above in definition.

118, Coating Apparatus, subclass 303 for apparatus for spray coating particulate material.*

148, Metal Treatment, subclasses 22+ for composition and 31.5 for a coated stock material.

149, Explosive and Thermic Compositions or Charges, subclasses 3+ for a coated component.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 81 for melting of a solid material in an airtight cavity and subclasses 145+ for encapsulating, when combined with a laminating step.

204, Chemistry: Electrical and Wave Energy, for pertinent subclass (es) as determined by schedule rewiew.

208, Mineral Oils: Processes and Products, for pertinent subclass (es) as determined by schedule rewiew.

252, Compositions, for miscellaneous compositions having special uses or functions.

260, Chemistry of Carbon Compounds, subclasses 709+.

420, Alloys or Metallic Compositions.

424, Drug, Bio-Affecting and Body Treating Composition, subclasses 16+ for coated, impregnated or layered feature.

425, Plastic Article or Earthware Shaping or Treating: Apparatus, subclass 5 for apparatus encapsulating normally liquid material in discrete, simultaneously formed containers.*

426, Food or Edible Material: Processes, Composition, and Products, subclasses 89+.

427, Coating Processes, subclasses 213.3+ for processes of encapsulating solid core materials.*

428, Stock Materials or Miscellaneous Articles, subclass 320.6 and subclass 321.5 for composite (e.g., layered, etc.) stock material involving a microencapsulated liquid and subclasses 402.2+ for coated particles or microscopic size. *Not a composition class.

429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, for pertinent subclass (es) as determined by schedule rewiew.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 138 for a microcapsule.

451, Abrading, especially subclass 295 for impregnating or coating an abrasive tool.

501, Compositions, Ceramic, for pertinent subclass (es) as determined by schedule rewiew.

502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, subclasses 60+ and 527.11-527.24.

504, Plant Protecting and Regulating Compositions, for pertinent subclass (es) as determined by schedule rewiew.

520, Synthetic Resins or Natural Resins, see, for example, Class 523, subclass 161 invisible ink composition and subclasses 200+ for a composition containing product in the form of surface-coating, impregnated, encapsulated, or surface-modified material.

585, Chemistry of Hydrocarbon Compounds, (mixture subclasses).

588, Hazardous or Toxic Waste Destruction or Containment, subclasses 249+ for containment broadly of hazardous or toxic waste.

4.1 Liquid encapsulation utilizing an emulsion or dispersion to form a solid-walled microcapsule (includes liposome):
This subclass is indented under subclass 4. Subject matter wherein a medium in the form of an emulsion or dispersion is used to affect encapsulation of the liquid. The medium may contain one or more polymers, polymer precursors, monomers or other encapsulating materials, e.g., gelatin, wax, etc.

(1) Note. Liposomes are formed of mesomorphic walls (i.e., a state of matter intermediate between crystalline solid and normal isotropic liquid) and are classified here based on their solid characteristics.

4.3 With treatment subsequent to solid-wall formation (e.g., coating, hardening, etc.):
This subclass is indented under subclass 4. Subject matter wherein solid-walled microparticles are subjected to a significant chemical or physical after-treatment, e.g., heating, formaldenhyde crosslinking, etc., the recitation of "hardening the formed microcapsule" is sufficient for placement here.

(1) Note. Techniques utilized for merely recovering the microencapsulated product are not the type of after-treatment considered, e.g., filtering, precipitating, centrifuging, evaporating, distilling, sieving, etc. Drying techniques also not considered as after-treatment are spray drying, freeze drying (lyophilization), drum drying, etc.

4.32 Microcapsule wall containing two or more layers:
This subclass is indented under subclass 4.3. Subject matter wherein the microencapsulation process produces a multilayered shell completely surrounding the liquid core.

4.33 Microcapsule wall derived from synthetic polymer:
This subclass is indented under subclass 4.3. Subject matter wherein the microencapsulation process produces a wall derived from a synthetic polymer which was prepared either prior to or during the process.

4.4 Solid-walled microcapsule formed by cooling molten materials:
This subclass is indented under subclass 4.1. Subject matter wherein solid wall formation is obtained by solidifying molten material by cooling below the melting point or range of the material.

4.6 Solid-walled microcapsule formed by physically removing a constituent (e.g., evaporation, extraction, etc.):
This subclass is indented under subclass 4.1. Subject matter wherein solid-walled material is obtained by physically removing a constituent of the colloidal emulsion or dispersion, e.g., evaporation, distillation, extraction, precipitation, etc.

4.7 Solid-walled microcapsule formed by in situ polymerization:
This subclass is indented under subclass 4.1. Subject matter wherein the solid-walled microcapsule is obtained by the polymerization of one or more reactants contained in the colloidal emulsion or dispersion system.

(1) Note. A patent which claims an in situ-generated polymer which subsequently reacts with a material, e.g., a crosslinking agent contained in the liquid core, is not classified here but in subclass 4.3.

5 FORMATION OF SOLID PARTICULATE MATERIAL DIRECTLY FROM MOLTEN OR LIQUID MASS (E.G., LIQUID COMMINUTING):
This subclass is indented under the class definition. Processes wherein a material in the liquid state is comminuted to form discrete particles and solidified in its comminuted form.

(1) Note. Where the purpose of the comminution is to effect a material separation rather than to produce a desired size product, the patent is not included herein, but will be found in the appropriate separation class, e.g., Class 159, Concentrating Evaporators, and Class 201, Distillation: Processes, Thermolytic, subclasses 7+.

(2) Note. To be classified in this subclass the material must be subdivided from an

original liquid mass and then the subdivided particles solidified with no substantial change in shape or size. Thus, precipitation of a powder, etc., from a solution is not provided for in this class in that an original liquid mass is not comminuted. Coagulation of droplets formed by comminution can be found in this or an indented subclass.

(3) Note. The compound and composition classes are superior to Class 264 in regard to liquid comminution and solidification unless otherwise noted where: A. The product is formed and comminution is recited only broadly, as by name only; B. The reactants are comminuted merely to enhance a chemical reaction C. The final product size and shape is not controlled or limited by the size and shape of the comminuted liquid particles (see (2) Note above) or, D. The product is a stable colloid or catalyst composition.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 1.22 for apparatus and methods for making bullets and shot usually involving a plurality of metal working operations and subclasses 4.51+ for the production of metal shreds by a cutting operation.

62, Refrigeration, subclass 74 for processes there provided for of congealing (freezing) material involving spraying or dripping.

65, Glass Manufacturing, subclasses 376+ for processes of glass fiber or filament making; subclasses 21.1+ for self-supporting particle making from glass or glasslike materials.

71, Chemistry: Fertilizers, subclasses 64.01+ for other processes of preparing fertilizer commercial forms and also fertilizer forms as articles of manufacture.

72, Metal Deforming, subclasses 253.1+ for metal extruding.

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 331+ for production of free metal in particulate form or production of alloy or metallic composition in particulate form by comminuting directly from liquid metal. Patents which claim only a process of comminuting and solidifying a liquid metal to form discrete particles are classified as originals in Class 75. Patents in which the claims are broad or nondefinitive as to material and the disclosure states that materials other than metal are processed by the invention will go as originals to Class 264. Patents having claims to forming solid particulate metal and claims to forming solid particulate nonmetal or patents having generic claims with a disclosure to forming solid particulate metal and to forming solid particulate nonmetal will go as originals to Class 264 and a cross-reference will be placed in Class 75.

159, Concentrating Evaporators, subclasses 48.1+ for processes of concentrating by spraying.

164, Metal Founding, appropriate subclasses for processes of forming particulate metallic particles by means of a shaping surface and subclass 272 for metal revolving or tumbling type shaping apparatus.

204, Chemistry: Electrical and Wave Energy, subclass 192.1 for processes of coating or forming by cathode sputtering.

241, Solid Material Comminution or Disintegration, subclasses 1 through 30 for processes of comminuting and disintegrating solid materials.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 6+ for corresponding apparatus.

428, Stock Material or Miscellaneous Articles, subclass 87 for a product with a pile or nap type surface and including particles, subclasses 143+ for a stock material product in the form of a single or plural layer web or sheet which has a textured surface comprising particulate matter, subclasses 323+ for a composite web or sheet including a

component having structurally defined particles, subclasses 402+ and 570 for structurally defined or coated particles and subclasses 546+ for metallic stock comprising metal particles.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 1+ for continuous gas or vapor phase colloid system (e.g., smoke, fog, aerosol, cloud, mist), subclasses 31+ for colloid systems of colloid-sized solid or semi-solid phase dispersed in primarily organic continuous liquid phase, subclasses 38+ for colloid systems of colloid-sized bituminous, coal, or Carbon phase dispersed in aqueous continuous liquid phase, subclasses 77+ for colloid systems of colloid-sized solid phase dispersed in aqueous continuous liquid phase; or agents for such systems or making or stabilizing such systems or agents; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

588, Hazardous or Toxic Waste Destruction or Containment, subclasses 252+ for solidification of hazardous or toxic waste.

6 With subsequent uniting of the particles:

This subclass is indented under subclass 5. Processes wherein the formed discrete particles are mass or bulk assembled and bonded to each other to form a unitary article.

SEE OR SEARCH THIS CLASS, SUBCLASS:

115+, for formation or liberation of fibers or particles from solid materials and uniting thereof.

SEE OR SEARCH CLASS:

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 228+ for a consolidated metal powder composition.

419, Powder Metallurgy Processes, appropriate subclasses for producing metals or alloys or metallic compositions in a solid or compact state from powdered or particulate material with or without heating.

428, Stock Material or Miscellaneous Articles, subclasses 546+ for metallic stock comprising metal particles.

7 Coated particles:

This subclass is indented under subclass 5. Processes wherein the comminuted material is coated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

4, for methods of forming filled capsules.

129+, for subsequent coating of articles, which have been formed by a process within the class definition.

SEE OR SEARCH CLASS:

427, Coating Processes, subclasses 212+ for processes of coating particles, flakes, or granules.

428, Stock Material or Miscellaneous Articles, subclass 570 for metal particles coated with another metal.

8 Utilizing centrifugal force or rotating forming zone:

This subclass is indented under subclass 5. Processes wherein the liquid or molten material is comminuted by means of centrifugal force or a revolving or rotating forming surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

309, for processes wherein material is flung or sprayed against a mold surface.

9 By vibration or agitation:

This subclass is indented under subclass 5. Processes wherein the particles are formed by agitation or vibration of the liquid or molten mass to fling or shake off said particles.

10 Utilizing electrical energy:
This subclass is indented under subclass 5. Processes wherein some form of direct electrical energy is employed to comminute the liquid or molten mass into particles.

11 By impinging plural liquid masses:
This subclass is indented under subclass 5. Processes wherein the particles are formed by causing plural liquid streams to impinge forcibly.

(1) Note. The liquid streams may be of the particle forming material only or of both particle forming and nonparticle forming materials.

(2) Note. Turbulent fluid flow type comminuting is considered agitating for subclass 9 above.

12 By impinging or atomizing with gaseous jet or blast:
This subclass is indented under subclass 5. Processes in which the particles are formed by impinging with or directing a jet or blast of a gas into contact with the liquid or molten material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
13, for processes of liquid comminuting in which the material is sprayed, per se, through particle forming orifices by employing a relatively large pressure head of liquid.

13 By extrusion spraying or gravity fall through orifice:
This subclass is indented under subclass 5. Processes wherein the particles are formed by flowing or allowing the liquid material to fall through a forming orifice.

SEE OR SEARCH THIS CLASS, SUBCLASS:
12, for spraying by impinging a liquid body or stream with a gas jet.
15, for processes in which preformed solid particles are rounded or spheroidized as by passing said particles through a heated fluid.

14 Into moving fluid:
This subclass is indented under subclass 13. Processes in which the formed particles pass into or through a moving fluid medium.

SEE OR SEARCH THIS CLASS, SUBCLASS:
180, for processes of forming continuous or indefinite length work in which the product is extruded into a liquid bath in motion.

15 SPHEROIDIZING OR ROUNDING OF SOLID PARTICLES:
This subclass is indented under the class definition. Processes directed to the reshaping of solid, irregular or nonspherical particulate matter wherein said irregularities are diminished or the particles are caused to become more spherical or rounded in shape without loss of material therefrom and by means other than use of a mold or shaping surface therefor and in which the individual and separate identities of the particles is maintained.

(1) Note. Patents in this subclass are generally directed to those processes in which heat is employed to soften the particles so as to permit the internal cohesive forces of the particles to effect said reshaping as defined.

SEE OR SEARCH THIS CLASS, SUBCLASS:
5+, particularly subclasses 13+ for processes forming particulate material directly from a molten or liquid mass.
109+, for processes of forming articles by uniting of nonmetal particles in which the overall configuration of the particles may be altered in the process.
162, for surface finishing by abrading.
320+, for processes of reshaping an article in which a mold or solid shaping surface is employed.
341, for processes of treating a solid article in which the surface is smoothed by solvent polishing.

SEE OR SEARCH CLASS:
75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Composi-

tions, and Loose Metal Particulate Mixtures, subclass 342, for spheroidizing or rounding of existing solid metal particles. Patents having claims to spheroidizing or rounding of solid metal particles and claims to spheroidizing or rounding of solid, nonmetal particles or patents having generic claims with a disclosure to spheroidizing or rounding of solid, metal particles and to spheroidizing or rounding of solid, nonmetallic particles will go as originals to Class 264 and a cross-reference will be placed in Class 75.

201, Distillation: Processes, Thermolytic, subclasses 5+ for a thermolytic distillation process including the step of shaping solid carbonaceous material without using a mold.

16 DENTAL SHAPING TYPE:

This subclass is indented under the class definition. Processes wherein articles are formed which conform to the contour of the human mouth or which simulate a tooth.

SEE OR SEARCH CLASS:

164, Metal Founding, appropriate subclasses for dental casting processes under the class definition.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 67 for electroforming methods of producing dentures.

249, Static Molds, subclass 54 for dental type molds.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 2 for shaping apparatus utilizing an anatomical body or portion thereof as a shaping surface.

433, Dentistry, subclasses 167+ for prosthodontic methods directed to or including specific dental steps.

17 Denture forming:

This subclass is indented under subclass 16. Processes wherein the article formed includes at least one tooth and a support conjoint therewith.

18 Forming denture base against preformed teeth:

This subclass is indented under subclass 17. Processes wherein the support is formed by casting or molding against preformed teeth.

SEE OR SEARCH THIS CLASS, SUBCLASS:

259+, appropriate subclasses indented thereunder for processes of forming composite articles, per se, in which material is shaped and united to a preformed self-sustaining body.

19 Tooth forming:

This subclass is indented under subclass 16. Processes wherein the article formed by molding or casting simulates a tooth or portion thereof.

20 Shaded layer:

This subclass is indented under subclass 19. Processes wherein the tooth or portion thereof is formed so as to provide a color or tone differential across the member.

SEE OR SEARCH THIS CLASS, SUBCLASS:

73+, and 78, for molding processes of general utility which include a coloring or dyeing step.

245+, for processes of general utility forming a multi-colored composite body.

21 SHAPING OR TREATING LUMINESCENT MATERIAL:

This subclass is indented under the class definition. Processes directed to molding or treating articles having a composition including a luminescent, phosphorescent, or fluorescent ingredient.

SEE OR SEARCH CLASS:

252, Compositions, subclasses 301.16 through 310.6 for fluorescent or phosphorescent compositions.

427, Coating Processes, subclasses 157+ for processes of coating utilizing fluorescent or phosphorescent coating.

(2) Note. The energy must be applied as such to the work. Conversion of electrical energy to heat and the

application of the heat to the work is excluded from this subclass and is provided for in appropriate subclasses below.

(3) Note. The laser ablation of a Class 264 material in the absence of an added reactive chemical is proper for Class 264. When a reactive chemical is used in the laser ablation the subject matter is proper for etching Class 216.

28 WITH STEP OF COOLING TO A TEMPERATURE OF ZERO DEGREES C. OR BELOW:

This subclass is indented under the class definition. Processes which include subjecting the molding material or product to a cooling, freezing or refrigeration step which lowers the temperature of the material or product to at least O°C or 32°F.

SEE OR SEARCH THIS CLASS, SUBCLASS:

237, and 348, for processes which include a cooling step which does not cool to product or shaping material to at least 0°C.

29.1 CARBONIZING TO FORM ARTICLE:

This subclass is indented under the class definition. Processes wherein a carbonaceous material is subjected to a heat treatment in a substantially nonoxidizing atmosphere to produce a product containing elemental carbon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

105, for processes of molding or shaping electroconductive material, which material contains elemental carbon, at least in part.

603+, for firing, sintering or vitrifying operations on inorganic shaped materials which are not directed to carbonizing the material.

SEE OR SEARCH CLASS:

44, Fuel and Related Compositions, subclass 599 for a process of making a consolidated fuel solids composition which includes a step of carbonizing using a specified condition or technique.

201, Distillation: Processes, Thermolytic, appropriate subclass, for a process of thermolytic distillation of carbonaceous material, e.g., coking, etc.

423, Chemistry of Inorganic Compounds, subclasses 445+ for elemental carbon, per se, and its manufacturing processes involving a chemical reaction. For the line between 423 subclasses 445+ and this class concerning combined processes of molding and carbonizing, see the class definitions of this class, section II. A. 10).

427, Coating Processes, subclasses 307+ for coating processes including flame contact.

502, Catalyst, Solid Sorbent, or Support Therefor: Product or Process of Making, for a composition comprising a catalyst or sorbent, per se, which may be activated carbon. Activated carbon is proper for Class 502, rather than Class 423.

29.2 Filaments:

This subclass is indented under subclass 29.1. Processes directed to making articles in which the length is relatively much greater than the width and thickness.

29.3 Agglomeration or accretion:

This subclass is indented under subclass 29.1. Processes including the step of tumbling or otherwise agitating a mass of fine discrete particles to cause adherence of the particles to one another thereby producing larger sized particles prior to carbonizing.

29.4 From cellulosic material:

This subclass is indented under subclass 29.1. Processes wherein the article carbonized includes cellulosic material or its derivatives.

29.5 With carbonizing, then adding carbonizable material and recarbonizing:

This subclass is indented under subclass 29.1. Processes which prepare an article by carbonizing and then subsequently add a carbonizable material (e.g., by impregnating) and recarbonize.

29.6 CARBONIZING TO FORM ARTICLE:
This subclass is indented under subclass 29.1. Processes wherein one step of carbonization takes place in a specifically recited atmosphere other than vacuum or air.

(1) Note. The recitations inert, nonoxidizing, or the like shall be considered sufficient to place the patent in this subclass.

(2) Note. One step of carbonizing may occur in an oxidizing atmosphere as long as the process also includes a step of carbonizing under nonoxidizing conditions.

29.7 Controlling varying temperature or plural heating steps:
This subclass is indented under subclass 29.1. Processes wherein the carbonizing step is carried out by (1) varying the temperature over a given time span or by (2) heating the article to two or more distinct temperatures.

(1) Note. Heating the article to cure binder or dry is not considered carbonizing unless positively disclosed that such occurs under those conditions.

(2) Note. Heating to a temperature to cause a change in crystalline form of the carbon (e.g., graphitizing) is considered a step of carbonizing for this subclass.

30 FURNACE LINING FORMATION OR REPAIR:
This subclass is indented under the class definition. Processes which are directed to (1) maintaining, restoring, or rebuilding a damaged, defective, or worn furnace lining or (2) forming an original interior layer on the furnace wall which remains in place during furnace use.

(1) Note. This is the residual home for furnace lining formation or repair not elsewhere provided for. In general, however, the combination of building a furnace and applying a lining to the interior thereof is classified in the class providing for the particular method of building the furnace. For classes which provide for furnaces and furnace lining, see the notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
36, for processes under the class definitions for repairing or restoring articles, per se.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 402.01+, especially 402.18 for repairing processes which include only mechanical assembly and joining operations.
52, Static Structures (e.g., Buildings), subclasses 741.1+ and 745.01+ for processes of assembling or in situ erection of a building involving more than repair by a process for Class 264.
65, Glass Manufacturing, subclass 27 for processes of repairing apparatus for that class.
75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclass 301 for reactive furnace linings.
110, Furnaces, subclass 343 for a process of treating solid fuel furnace constituents to prevent corrosion of the furnace.
122, Liquid Heaters and Vaporizers, appropriate subclass for furnace structures provided therein under the class definition.
126, Stoves and Furnaces, particularly subclasses 144+ for linings.
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 94+ for processes of repairing articles by a laminating process.
252, Compositions, subclasses 500+ for furnace lining composition or linings defined only in terms of their composition when the composition is electrically conductive.
266, Metallurgical Apparatus, appropriate subclass for metallurgical furnaces, particularly subclasses 280+ for linings.
373, Industrial Electric Heating Furnaces, subclasses 137, 155 and 164.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, appropriate subclasses for furnaces for carrying out chemical reactions.

427, Coating Processes, subclasses 140+ for restoring or repairing by a coating process.

432, Heating, subclass 3 for a residual process of heater operation including a step of repairing, converting or assembling the heater.

501, Compositions: Ceramic, appropriate subclasses for ceramic compositions, per se.

520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Class 523, subclass 141 for a composition containing a synthetic resin or natural rubber having utility for a metallurgical furnace or oven apparatus or to processes of preparing said composition.

31 FORMING STRUCTURAL INSTALLATIONS IN SITU:

This subclass is indented under the class definition. Processes directed to the formation in situ of an erected structure or a part thereof.

(1) Note. Included here are only processes for forming those structures which are not intended to be moved or transported after the final molding step. For example, forming a prefabricated wall is not included here but placed in appropriate subclasses below, while forming a wall or portion thereof in its final intended position is included here. Forming parts by a molding operation and uniting in situ by a second molding operation is also included here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

30, for processes of forming furnace linings in situ.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclasses 745.01+ for particular processes of forming or assembling an in situ structure. The line between Class 264 and Class 52 is: Class 52 takes (1) forming in situ erected building structures by uniting preformed modules, e.g., bricks, cinder blocks, etc., and (2) other processes involving molding when combined with a building formation step which is more than a mere perfecting step for the molding such as (a) forming elements by molding, and joining the molded elements together, or to another element, by nonmolding means and (b) uniting a mold form with the surface of the molded body and permitting the form to remain as a portion of the building construction. Class 264 takes process of molding, per se, including forming building structures in situ when such processes include only molding steps. For example, processes for embedding elements such as reinforcements in the molded product or molding structural elements and then uniting the elements by a molding operation are within the scope of this class.

249, Static Molds, subclasses 1+ for in situ construction engineering type molds.

404, Road Structure, Process, or Apparatus, subclasses 72+ for processes of building roads. The line between Classes 264 and 404, is as follows: Class 404, provides for processes of forming roads except that Class 264 provides for such road making processes which include only the steps of molding monolithic uniform composition structure and/or compacting, treating, stressing or surface working the material to perfect the molding or curing of the molded body.

405, Hydraulic and Earth Engineering, appropriate subclasses for processes of earthworking, e.g., digging, filling, etc., combined with molding, especially subclass 222 for a method of casting a structure in a marine environment; and subclasses 233+ for a method of casting a pile or pier in situ.

32 Arched, domed, or vertical-cylindrical structure:

This subclass is indented under subclass 31. Processes in which the structure formed includes either an arched or domed portion or a portion which is vertically cylindrical.

33 Repositioning or moving mold to form sequential portions of a structure:

This subclass is indented under subclass 31. Processes in which at least a portion of the mold is removed from the structure and repositioned and used to form a second portion of the structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

34, for processes of sequentially molding different portions of a structure by using different molds.

SEE OR SEARCH CLASS:

249, Static Molds, subclasses 20+ for molds for forming a wall progressively.

34 Sequentially molding in situ different portions or layers on a unitary structure:

This subclass is indented under subclass 31. Processes in which portions of the in situ structure are formed in sequentially distinct steps.

(1) Note. Incremental as well as diverse molding steps are included herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

33, for processes in which the sequential formation steps are accomplished by repositioning mold parts

250, and 308, for incremental molding of structures other than in situ.

SEE OR SEARCH CLASS:

249, Static Molds, subclass 15 for mold for forming a facing on product or existing structure.

35 Uniting preform member with molding material:

This subclass is indented under subclass 31. Processes in which a preform member or a portion thereof becomes embedded in or united to the molded material and remains to form a structural part of the product.

(1) Note. Embedded elements which serve solely as reinforcement and have no other structural purpose are not considered proper for this subclass but are placed according to the molding operations.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271, for processes of shaping material around a preform to surround or embed said preform.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), for processes in which structural elements which make up an exterior portion of the final construction are used to retain the molding material and remain in place after the molding operation. Pipes or tubes embedded in the molding material are considered proper for Class 264.

249, Static Molds, subclasses 83+ for molding apparatus for uniting a preform with fluent material.

36.1 REPAIRING OR RESTORING CONSUMER USED ARTICLES FOR REUSE:

This subclass is indented under the class definition. Processes wherein a worn, damaged, or consumer used article is renewed or reconditioned for reuse in a capacity similar to that of the original article, without substantially altering or destroying the overall configuration of the original article.

SEE OR SEARCH THIS CLASS, SUBCLASS:

30, for processes for repairing furnace linings.

37.1, for processes involving reuse of articles or article forming material in which flash, trim, or product rejects are recycled and put through an overall mixing and/or reshaping, and see subclass 37.1 notes thereto.

SEE OR SEARCH CLASS:

152, Resilient Tires and Wheels, subclass 367 for devices, e.g., patches applied to a tire surface for covering a puncture or blowout, wherein the claims involve a superficial fixing of the tire and do not involve a substantial removal of the material of the tire to permit rebuilding.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 94+ for repairing by a laminating operation.

369, Dynamic Information Storage or Retrieval, subclasses 153+ for similar subject matter combined with recording on a restored storage medium element.

401, Coating Implements With Material Supply, subclass 50 for a lipstick, crayon, or the like combined with means to reshape the working end.

427, Coating Processes, especially subclasses 140+ for restoring or repairing by a coating operation.

428, Stock Material or Miscellaneous Articles, subclass 63 for a product in which a hole or depression has been patched and subclass 912 (a cross-reference art collection) for a product having a puncture healing layer.

36.11 Articles containing nontextile porous material (e.g., foam, sponge, etc.):

This subclass is indented under subclass 36.1. Processes wherein the article to be renewed or reconditioned contains randomly dispersed pores or voids and contains no textile.

(1) Note. Acceptable for this subclass are composite-structured articles wherein one article section may be porous while another article section is nonporous.

(2) Note. Utilizing putty to repair wooden articles for reuse is properly classified in this subclass since wood is considered to be inherently porous.

(3) Note. Renewal and reconditioning of fabric and cloth material (e.g., textiles, etc.) are excluded from placement in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41, for processes of forming pores or voids.

317, for processes, generally, which involve the destruction of material which may leave a space or void.

321, for processes of reshaping previously foamed material.

413, for processes of producing or treating a porous product by direct application of electrical or wave energy.

915, for recycling of consumer used articles made of sponge-like, porous, or foamed material.

36.12 Balls or rollers (e.g., printing rollers, golf balls, etc.):

This subclass is indented under subclass 36.1. Processes wherein the article which is to be renewed or reconditioned is a spherical or non-hollow columnar shaped body.

36.13 Sound records (e.g., by removing grooves, etc.):

This subclass is indented under subclass 36.1. Processes wherein the article which is to be renewed or reconditioned has sound reproducing grooves on its surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

106, for forming sound reproducing grooves in an article utilizing a molding operation.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, subclass 37 for sound recording compositions, per se.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 68 for electroforming methods of producing sound records.

369, Dynamic Information Storage or Retrieval, subclasses 84+ for dynamic recording.

428, Stock Material or Miscellaneous Articles, subclasses 64.1+ for a disc which does not have sound tracks.

434, Education and Demonstration, subclass 318 for visual and audio education and demonstration wherein the audio is recorded on a disk.

520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Class 523, subclass 174 for a composition containing a synthetic resin or natural rubber having utility as a phonograph record molding composition or to processes of preparing said composition.

36.14 Toroidal shapes (e.g., resilient tires, etc.):
This subclass is indented under subclass 36.1. Processes wherein the article to be renewed or reconditioned is toroidal in shape (i.e., doughnut shaped).

(1) Note. A toroidal shape is comprised of a figure having a surface generated when rotated about an axis lying in the same plane therewith, but not intersecting or containing, an axis in its own plane.

(2) Note. The majority of the art in this subclass relates to processes for repairing or restoring vehicle tires, but the subclass is not so limited.

SEE OR SEARCH THIS CLASS, SUBCLASS:
911, for recycling of toroidal shaped consumer used articles.

SEE OR SEARCH CLASS:
81, Tools, subclasses 15.2+, 15.3, and 15.4 for portable tools used in repairing resilient vehicle tires.
152, Resilient Tires and Wheels, subclass 367 for devices, e.g., patches applied to a tire surface for covering a puncture or blowout, wherein the claims involve a superficial fixing of the tire and do not involve a substantial removal of the material of the tire to permit rebuilding.
156, Adhesive Bonding and Miscellaneous chemical Manufacture, subclasses 94+, for processes which are (a) combined with the step of recovering material utilized in a previous laminating procedure and/or (b) directed to restoring or rebuilding a damaged or defective article or material by a laminating procedure.

36.15 Hollow- or container-type articles (e.g., vase, pipes, cups, tubes, etc.):
This subclass is indented under subclass 36.1. Processes wherein the article to be renewed or reconditioned has an intentionally constructed nonrandom void or opening therethrough or has a nonrandom inner or concave surface or cavity.

(1) Note. The mere presence of a chip or crack in an article is not considered sufficient to render the article hollow for the purposes of this subclass, unless the overall macrostructure of the entire article meets this subclass definition. See search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
36.18, for repairing or restoring cracks or chips in articles containing inorganic material for reuse, especially subclass 36.21 for repairing or restoring cracks or chips in nonhollow or noncontainer- type glass articles.
36.22, for repairing or restoring cracks or chips in articles containing polymeric material or treating cracks or chips in nonhollow or noncontainer-type articles of polymeric material.

SEE OR SEARCH CLASS:
138, Pipes and Tubular Conduits, especially subclass 97 for processes and apparatus for repairing leaks in pipes and hose for reuse when no molding step is present.
206, Special Receptacle or Package, appropriate subclasses for special use receptacle, container, or package.
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 11 for apparatus used to repair or restore an article for reuse.

36.16 Pipes or tubes:
This subclass is indented under subclass 36.15. Processes, wherein the article to be reconditioned or renewed is a self supporting open ended hollow conduit (e.g., hose, etc.).

(1) Note. Repairing or reconditioning pipe joints utilizing a molding operation is properly classified here.

(2) Note. Repairing or reconditioning of concrete or hydro-set pipes or tubes is properly classified as original in this subclass with crosses below as deemed suitable.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 97+ for repairing pipes, tubes and hose not otherwise classifiable.

249, Static Molds, subclasses 83+, particularly subclass 90 for molds for repairing leaks in pipes.

405, Hydraulic and Earth Engineering, subclass 154.1 for subterranean or submarine pipe or cable laying, retrieving, manipulating, or treating; and subclass 188 for an apparatus or method for enabling personnel to work on a section of submerged pipeline.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 11+ for a product or preform repair or restoring means comprising a molding apparatus for shaping or reshaping nonmetals.

36.17 By application of internal fluid pressure differential to permanently shape, distort, or sustain material to repair or restore pipes or tubes (e.g., flexible bladder, expandable tubular pig, etc.):

This subclass is indented under subclass 36.16. Processes wherein a positive or negative pressure is internally applied to renewing or reconditioning material through the medium of a liquid or gas in direct or indirect contact therewith to shape or maintain a desired configuration.

36.18 Inorganic material containing articles (e.g., plaster board, ceramic, fiberglass, etc.):

This subclass is indented under subclass 36.1. Processes wherein the article to be renewed or reconditioned contains inorganic material.

(1) Note. Processes of repairing or restoring an article containing inorganic material, as well as organic material present as bonding agents, solvents, fillers, etc., are properly classified herein.

SEE OR SEARCH CLASS:

260, Chemistry of Carbon Compounds, note 34, for the distinction between the terms “organic” and “inorganic”.

427, Coating Processes, subclasses 136+ for coating inorganic material containing road surfaces.

36.19 Clad wire or cable (e.g., by restoring sheathing, etc.):

This subclass is indented under subclass 36.18. Processes wherein the inorganic material containing article is a clad (sheathed) usually metallic strand or a collection of clad strands or rods.

(1) Note. Class 264 excludes any metal working, casting or welding operations.

36.2 Hydro-set material (e.g., cement, concrete, plaster board, etc.):

This subclass is indented under subclass 36.18. Processes wherein the article to be renewed or reconditioned contains or is treated with an aqueous fluent inorganic composition that solidifies (e.g.,cures, sets, etc.).

(1) Note. Processes of repairing or restoring an article containing inorganic hydrosettable material, as well as organic material present as bonding agents, solvents, fillers, etc., are properly classified herein.

36.21 By shaping nonglass material to repair damaged glass:

This subclass is indented under subclass 36.18. Processes wherein a material other than glass is shaped to renew or recondition the damaged glass.

(1) Note. The use of a plastic material which is injected into a crack in a damaged glass windshield is proper for this subclass.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, for repairing of glass articles or combinations of glass working or glass making combined with a Class 264 operation.

36.22 By polymerizing, cross-linking, or curing (e.g., hardening, etc.):

This subclass is indented under subclass 36.1. Processes wherein the reconditioning or renewing of the article includes a polymerization, cross-linking, curing, or hardening operation.

(1) Note. Claimed subject matter which includes one of the terms in the following list is properly classified herein: a. cross-linking b. curing c. addition polymerization d. condensation polymerization e. block or graft polymerization f. hardening This list is not intended to be exhaustive and is not limited to the above examples.

37.1 RECYCLING OF RECLAIMED OR PURIFIED PROCESS MATERIAL (NOT RECYCLED CONSUMER USED ARTICLES):

This subclass is indented under the class definition. Processes in which process materials (e.g., flash, trim, defective products, molding materials from which products are formed, treating materials utilized in the molding process, etc.) which were previously employed in a molding operation, whether from batch or continuous process, are recycled or reused in the same or a different molding operation.

(1) Note. Recycling of consumer used articles (e.g., scrap articles or worn materials, used tires, materials employed in commerce, etc.) or articles intended for consumer use are not considered proper under this subclass. However, recycling of defective or improperly molded articles (e.g., virgin material, etc.) will be considered proper for this subclass.

(2) Note. Merely recycling reclaimed "as is" process material as hereinabove set forth is sufficient for placement in this subclass. It is not essential that a step of purification, reclamation, or separation of the desired process material be present for a process to be proper for this subclass. Thus, recycling of a desired polymeric process material does not require separation from a solvent thereof to be proper in this subclass.

(3) Note. Recycling of heat exchange agents, per se, that directly contact shaped articles or process materials is considered proper under this subclass. However, recycling of heat exchange agents that do not directly contact shaped articles or process materials (e.g., cycling of liquid coolant through hollow mold walls, etc.) are not proper for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

169+, for processes of forming continuous or indefinite length articles including the step of preventing equipment fouling accumulations or deposits.

179, for processes of purifying or replenishing a liquid bath for receiving extruded material.

195, for processes of chemically treating viscose articles which may include removal of contaminants therefrom.

340, for processes within the class definition for treating preformed, shaped, or solid articles.

349, for processes within the class definition which relate to mixing, kneading or mulling of materials.

910+, for processes which involve recycling consumer used articles or products.

SEE OR SEARCH CLASS:

201, Distillation: Processes, Thermolytic, subclass 25 for conversion of waste by heat to products which include a solid carbon char.

520, Synthetic Resins or Natural Rubbers, particularly Class 521, subclasses 40+ for processes of reclaiming a synthetic resin.

585, Chemistry of Hydrocarbon Compounds, subclasses 240+ for a process wherein refuse is converted to a mixture of hydrocarbons, usually for use as a fuel.

37.11 Vaporizing to recycle liquid:

This subclass is indented under subclass 37.1. Processes wherein a liquid process material is recycled or recovered by changing to a gaseous state and back to a reusable liquid state.

(1) Note. A liquid is considered to be a state of matter which exhibits a characteristic readiness to flow, little or no tendency to disperse, and relatively high incompressibility.

(2) Note. A gas is considered to have a very low density and viscosity, relatively

great expansion and contraction with changes in pressure and temperature, and to be readily diffusive, with a tendency to expand indefinitely, with molecules in free movement.

(3) Note. Liquid process materials found here are vaporized, condensed, and reused in a molding process.

37.12 The liquid is, or is part of, an extrudant bath:
This subclass is indented under subclass 37.11. Processes wherein the liquid is, or is part of, an extrudant receiving liquid bath process material.

37.13 The liquid is a solvent for organic process material:
This subclass is indented under subclass 37.11. Processes wherein the liquid is a material which is used to dissolve organic process material.

SEE OR SEARCH CLASS:
260, Chemistry of Carbon Compounds, note 34, for the distinction between the terms “organic” and “inorganic”.

37.14 Of gaseous process material (e.g., cooling gas, blowing gas, etc.):
This subclass is indented under subclass 37.1. Processes wherein the reclaimed or process material is a gas, (e.g., vapor, cloud, fog, haze, or mist, etc.) under standard conditions.

(1) Note. A gas is considered to have a very low density and viscosity, relatively great expansion and contraction with changes in pressure and temperature, to be readily diffusive, with a tendency to expand indefinitely, with molecules in free movement.

37.15 Of gas utilized in forming porous material:
This subclass is indented under subclass 37.14. Processes wherein the gaseous process material is used to form pores or voids in molded or shaped articles.

37.16 Of blow molding gas:
This subclass is indented under subclass 37.14. Processes wherein the gaseous material is from a blow molding process.

(1) Note. Blow molding is considered an operation wherein a positive or negative pressure is applied through the medium of a liquid or gas in direct contact with a work-piece to form or maintain a desired configuration.

37.17 Of gas utilized for heating or cooling:
This subclass is indented under subclass 37.14. Processes wherein the gaseous material is a heat exchange agent that directly contacts a molded article.

37.18 Of liquid process material (e.g., suspensions, etc.):
This subclass is indented under subclass 37.1. Processes wherein the reclaimed or purified process material is liquid.

(1) Note. A liquid is considered to be a state of matter which exhibits a characteristic readiness to flow, little or no tendency to disperse, and relatively high incompressibility.

37.19 From hydro-settable suspension:
This subclass is indented under subclass 37.18. Processes wherein the liquid process material is from an aqueous fluent inorganic composition that solidifies (e.g., cures, sets, etc.).

37.2 The liquid is from an extrudant-receiving bath: (e.g., liquid suspensions, etc.)
This subclass is indented under subclass 37.18. Processes wherein an extrudant-receiving liquid bath process material is recovered for recycling or reuse.

37.21 Containing ethylene or propylene carbonate in the bath:
This subclass is indented under subclass 37.2. Processes wherein the extrudant-receiving bath contains ethylene carbonate or propylene carbonate.

37.22 Containing acetic, nitric, or sulfuric acid in the bath:
This subclass is indented under subclass 37.2. Processes wherein the extrudant receiving bath contains acetic acid, nitric acid or sulfuric acid.

37.23 Containing zinc (Zn), lead (Pb), or copper (Cu) ions in the bath:
This subclass is indented under subclass 37.2. Processes wherein the extrudant-receiving bath contains zinc ions, lead ions, or copper ions.

37.24 With filtration:
This subclass is indented under subclass 37.2. Processes wherein a step is included which involves utilizing a filtering apparatus which is used to separate a recyclable liquid process material (e.g., using filters, screens, sieves, etc.).

(1) Note. A filter is considered to be an article or mass of material made of closely spaced or intimately arranged intermeshed or unconnected fibers, elements, strands, or particles that collectively act as a barrier to physically retain at least one constituent of a fluid mixture on its surfaces or in the spaces between the fibers, elements, strands, or particles while permitting passage of the remaining constituents.

SEE OR SEARCH CLASS:
210, Liquid Purification or Separation, for processes of separating solids from liquids, per se.

37.25 Into blow molding process:
This subclass is indented under subclass 37.18. Processes wherein the reclaimed liquid process material is recycled into or is reused in a blow molding operation.

(1) Note. Blow molding is considered an operation wherein a positive or negative pressure is applied through the medium of a liquid or gas in direct contact with a work-piece to form or maintain a desired configuration.

37.26 Into extrusion molding process:
This subclass is indented under subclass 37.18. Processes wherein the reclaimed liquid process material is recycled into or is reused in an extrusion molding operation.

(1) Note. Extrusion molding is considered an operation wherein an article is shaped or formed by forcing a supply of the article forming material through a confining and shaping orifice.

SEE OR SEARCH THIS CLASS, SUBCLASS:
37.2, for reclaiming an extrudant-receiving liquid process material.

37.27 Into injection molding process:
This subclass is indented under subclass 37.18. Processes wherein the reclaimed liquid process material is recycled into or is reused in an injection molding operation.

(1) Note. Injection molding is considered an operation wherein pressure is applied to a molding material so as to force said material from a source removed from a closed mold cavity into said cavity wherein the material assumes the shape of the interior of the closed cavity.

37.28 Of excess fiber or filament:
This subclass is indented under subclass 37.1. Processes wherein the reclaimed or purified process material is in the form of surplus fiber or filament.

(1) Note. A fiber or filament is generally considered a relatively slender, flexible element of macroscopic size having a length substantially greater than its width.

37.29 Of excess solid particulate (e.g., dust, powder, etc.):
This subclass is indented under subclass 37.1. Processes wherein the reclaimed or purified process material is surplus small bits of matter having definite shape, relatively great density, low internal heat content, and great cohesion of its molecules, which typically can be poured like a fluid when handled (e.g., granule, bead, powder, pellet, flake, particle, granulate, grain, etc.).

(1) Note. Solid particulates generally are distinguished from filamentary particles in that their shape and length-to-diameter ratio are such that in the dry state the particulates will not hold together as a massive article without the application of pressure or heat.

37.3 Of process trim or excess blanked material (e.g., sprue, runner, flash, etc.):
This subclass is indented under subclass 37.1. Processes wherein the reclaimed or purified process material is surplus process material which may, for example, have been stamped, excised, or rejected.

37.31 Into blow molding process:
This subclass is indented under subclass 37.3. Processes wherein the reclaimed surplus process material is recycled or is reused in a blow molding operation.

(1) Note. Blow molding is considered an operation wherein a positive or negative pressure is applied through the medium of a liquid or gas in direct contact with a work-piece to form or maintain a desired configuration.

37.32 Into extrusion molding process:
This subclass is indented under subclass 37.3. Processes wherein the reclaimed surplus process material is recycled or is reused in an extrusion molding operation.

(1) Note. Extrusion molding is considered an operation wherein an article is shaped or formed by forcing a supply of the article forming material through a confining and shaping orifice.

37.33 Into injection molding process:
This subclass is indented under subclass 37.3. Processes wherein the reclaimed surplus process material is recycled or is reused in an injection molding operation.

(1) Note. Injection molding is considered an operation wherein pressure is applied to a molding material so as to force said material from a source removed from a closed mold cavity into said cavity wherein the material assumes the shape of the interior of the closed cavity.

39 WITH STEP OF CLEANING, POLISHING, OR PRECONDITIONING APPARATUS FOR USE:
This subclass is indented under the class definition. Processes which include a step of cleaning or polishing or otherwise mechanically or physically treating the apparatus or a working surface thereof in order to restore, maintain or bring said apparatus to a desired or necessary operating condition.

(1) Note. Preheating a mold or maintaining a mold at a temperature sufficiently high to shape thermoplastic material is deemed to be a common expedient in the art and patents reciting these steps will be classified on other steps.

(2) Note. Included herein are patents reciting a step of precooling a mold to return it to operating temperature and the use of intermittently applied purging compositions as well as physical and solvent removal of contaminants, incrustations and/or surfaces of molds, per se.

(3) Note. The use of mold lubricants applied, per se, or incorporated in the molding composition is provided for elsewhere, see the search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

28, for processes including the step of cooling to 32°F or O°C.

85, for processes which include the step of flushing of a mold with an inert (nonsolvent) liquid.

169+, for processes which include the step of preventing equipment fouling accumulations and deposits in formation of continuous or indefinite length articles, which may include e.g., addition of an ingredient to spinning composition or bath or spinnerette of a particular structure or composition.

300, for casting, molding or die shaping, per se, in which a lubricant or release agent is incorporated directly into the molding composition.

327, for processes including the step of differential heating or cooling in the mold.

338, for processes which recite employment of specific mold coatings or linings which may be disclosed to be lubricants or antistick agents.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclass 27 for processes including cleaning of apparatus employed in glass working.

134, Cleaning and Liquid Contact With Solids, appropriate subclasses for cleaning of a mold, per se.

162, Paper Making and Fiber Liberation, subclasses 199+ for processes in papermakng which include an apparatus conditioning or preparing step.

164, Metal Founding, subclass 121 for preconditioning processes for metal casting apparatus and subclass 158 for apparatus of that class with cleaning means.

40.1 WITH MEASURING, TESTING, OR INSPECTING:

This subclass is indented under the class definition. Processes include the step of sampling, audibly or chemically testing or inspecting, or otherwise physically or mechanically determining some variable condition in a shaped article, molding material, the mold or shaping surface.

(1) Note. Included herein are processes for determining imperfections or for determining completeness of a reaction or manipulation as well as determinations of undesired variations which activate correction mechanisms. Recitations of optimum or desired temperatures of pressures or proportions of ingredients are considered nominal only and are classified with the disclosed process on some other basis.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 407 for processes including a step of testing or indicating combined with mechanical manufacture.

73, Measuring and Testing, appropriate subclasses for testing, per se.

162, Paper Making and Fiber Liberation, subclasses 49 and 198 for processes of testing or inspecting combined with a paper making operation.

164, Metal Founding, subclass 79 for metal casting operations employing a pore producing agent.

436, Chemistry: Analytical and Immunological Testing, subclasses 1+ for processes of chemical testing.

40.3 Controlling fluid pressure in direct contact with molding material:

This subclass is indented under subclass 40.1. Processes wherein the movement or shape of a molding material is controlled by direct contact of a fluid.

40.4 Measuring a weight or volume (e.g., level-responsive, etc.):

This subclass is indented under subclass 40.1. Processes wherein the weight or volume of the molding material is measured.

(1) Note. Operations of a container to a desired capacity or maintaining the molding material at a desired capacity is considered to be proper for this subclass.

40.5 Positioning of a mold part to form a cavity or controlling pressure of a mold part on molding material:

This subclass is indented under subclass 40.1. Processes wherein either the position of a mold part to form a shaping cavity or pressure of a mold part on the molding material is controlled.

(1) Note. Controlling the relative position of a doctor blade with respect to the molding material is included in this subclass.

40.6 Controlling heat transfer with molding material:

This subclass is indented under subclass 40.1. Processes wherein the introduction or removal of heat from the molding material is controlled.

40.7 Controlling rate of movement of molding material or its support in a continuous process:

This subclass is indented under subclass 40.1. Processes wherein the movement of the molding material or a substrate supporting the molding material in a continuous process is controlled.

(1) Note. A continuous process for this subclass is either (1) set up for repetitive operations or (2) wherein an endless

flow of molding material leaves the molding cavity.

41 PORE FORMING IN SITU (E.G., FOAMING, ETC.):

This subclass is indented under the class definition. Processes including the step of forming pores or voids in an article or material, said pore forming being effected internally by occluding or incorporating void forming or void producing elements or ingredients randomly throughout the plastic article forming material.

(1) Note. Where particulate material is united leaving spaces between the individual particles, the patent does not go here, but to subclass 109.

(2) Note. Processes wherein an article or material is mechanically performed to form voids are provided for in subclass 138.

(3) Note. Pore forming when not combined with significant molding is provided for in various classes and the general lines between those classes and Class 264 is followed even though the step of forming pores is recited.

(4) Note. Included within the scope of this and indented subclasses is enlarging voids already present in a material by expanding gases contained therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

317, for processes generally which involves the destruction of material which may leave a space or void.

321, for processes of reshaping previously foamed material.

610, for burning, vaporization, or melting of embedded element or core to form a nonrandom void during firing of an inorganic shaped article or preform.

SEE OR SEARCH CLASS:

51, Abrasive Tool Making Process, Material, or Composition, subclass 296 for pore forming in abrasive materials.

106, Compositions: Coating or Plastic, subclasses 122, 601+ and 672+ for pore forming, per se, in compositions within the definitions of the class.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 77+ for a pore forming step in combination with a laminating operation.

162, Paper Making and Fiber Liberation, subclass 101 for a pore forming step within the class definition.

366, Agitating, subclasses 3+ for a step of gas incorporation in mixing mortar.

501, Compositions: Ceramic, subclasses 39 and 80+ for pore-forming ceramic compositions.

521, Synthetic Resins or Natural Rubbers, subclasses 50+ for pore forming, per se, in a synthetic resin or natural resin composition.

588, Hazardous or Toxic Waste Destruction or Containment, subclass 255 for the forming of pores or voids in the production of a material containing hazardous or toxic waste for purposes of containment.

42 Of inorganic materials:

This subclass is indented under subclass 41. Processes wherein the material that is foamed is inorganic in nature.

SEE OR SEARCH THIS CLASS, SUBCLASS:

332, and 333, for general processes for molding inorganic materials employing heat or pressure.

43 Including vitrification or firing:

This subclass is indented under subclass 42. Processes wherein the inorganic material is heated to a sintering or fusion temperature.

SEE OR SEARCH THIS CLASS, SUBCLASS:

603+, for vitrifying or sintering processes of shaped bodies.

44 Burning out components to form pores:

This subclass is indented under subclass 43. Processes wherein the pores are formed by burning out an entrained combustible material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

610, for processes directed to firing, sintering or vitrifying in which an embedded part is burned out to leave a void.

656+, wherein a binder is used to hold together particulate material prior to firing and which is removed during firing.

45.1 Composite article making:

This subclass is indented under subclass 41. Processes directed to the production of a plural layered or multipart article.

45.2 Utilizing inflatable or expandable mold part or mold, per se:

This subclass is indented under subclass 45.1. Processes wherein a mold part is inflatable or expandable, or an inflatable form is used as a base on which foaming material solidifies.

(1) Note. Generally the inflatable or expandable feature is to facilitate insertion or removal of a plural layered of multipart article which is formed in a mold.

45.3 Incorporating particulate material, fibers, or batts in a random distribution within a foamed body:

This subclass is indented under subclass 45.1. Processes wherein particles, fibers, or batts are incorporated within the foamed mass in a random distribution.

SEE OR SEARCH THIS CLASS, SUBCLASS:

46.4+, for a process of forming fibers into a rigid layer and coating the rigid layer with foam in a separate step.

45.4 Forming one layer by uniting and expanding expandable thermoplastic beads or particles:

This subclass is indented under subclass 45.1. Processes wherein the material to be foamed is in the form of beads or particles which unite when expanded.

45.5 Autogenously formed surface layer or base supplies surface (e.g., skin forming, etc.):

This subclass is indented under subclass 45.1. Processes wherein: (1) The surface of a preformed material is treated so as to form a foam or, (2) Wherein a foam from a single foamable material is formed and the density of the foam at its exterior surface is different from the density of the foam in the interior thereof.

(1) Note. Processes involving the preparation of different density foams found herein generally involve the collapsing or prevention of the expansion of foaming material in a closed mold.

45.6 Foam surface layer produced by surface treatment of preformed base material:

This subclass is indented under subclass 45.5. Processes wherein the surface foam layer is produced by exposing the preformed base material to a treating agent.

45.7 Utilizing rotational molding operation:

This subclass is indented under subclass 45.1. Processes wherein foaming is caused in a rotational mold or in which the feedstock is forced into the mold by centrifugal force.

45.8 Forming indefinite length continuous work:

This subclass is indented under subclass 45.1. Processes wherein a continuous, running or indefinite length body is formed by an uninterrupted molding step or a sequential series of steps is preformed in a continuous manner.

(1) Note. The final article produced need not be of indefinite length, as for example, wherein the continuous, running or indefinite length body is cut into predetermined length pieces.

(2) Note. Extrusion is generally assumed to produce an indefinite length product.

45.9 On a preform or solidified layer which is spherical, toroidal, or annular:

This subclass is indented under subclass 45.8. Processes wherein material is shaped by forcing a supply of said material through an orifice.

46.1 With subsequent application of shaping force to form final desired shape:
This subclass is indented under subclass 45.9. Processes wherein following extrusion the extrudate is further shaped by the application of force.

46.2 Between at least two moving surfaces:
This subclass is indented under subclass 45.8. Processes wherein a foam is shaped by two moving surfaces.

(1) Note. Included herein are, for example, belts, rolls, or between a calender and a roll or a roll and a flat moving surface, etc.

46.3 With roller applied pressure :
This subclass is indented under subclass 46.2. Processes wherein shaping takes place between a pair of coating continuously moving surfaces and at least one of the surfaces is generally cylindrical and revolves about the longitudinal axis of the cylinder with rolling motion relative to the material shaped.

(1) Note. Included herein, for example, is shaping between a pair of rolls, a roll and an endless belt or by a calender.

46.4 Shaping material and uniting to a preform or solidified layer:
This subclass is indented under subclass 45.1. Processes in which a molding material remains united with a preform or solidified layer to constitute a composite article, one of whose layers is porous.

(1) Note. Solidified layer includes any collection of material given form by a shape defining means and possessing at least a minimal degree of cohesiveness, for example, layers formed by slush molding, spraying or layup on a mold or more generally any material that would be a preform, but for the fact that it remains in the mold in which it is formed.

46.5 Uniting spaced preforms or solidified layers by introducing foamable material therebetween:
This subclass is indented under subclass 46.1. Processes wherein two distinct preformed bodies or solidified layers with opposing surfaces are positioned in a spaced relationship with each other and a porous material at least partially fills the space between them, said porous material acting to unite the preforms or solidified layers and being contained at least in part by said preforms or solidified layers.

SEE OR SEARCH THIS CLASS, SUBCLASS:
45.8+, for uniting spaced preforms where the preforms are of indefinite length.

46.6 Against inner surface of a hollow preform or solidified layer:
This subclass is indented under subclass 46.4. Processes wherein foam material is deposited in a recess or cavity in a preform or solidified layers such that the preform or solidified layer forms the surface of a fully or partially foam filled article.

(1) Note. This subclass includes filling hollow articles with foam and making foam filled or plugged articles.

46.7 Utilizing metal part or reinforcement:
This subclass is indented under subclass 46.4. Processes wherein a metal part or a material which lends strength or rigidity to the final article is covered with foam.

SEE OR SEARCH THIS CLASS, SUBCLASS:
46.5, for panels with reinforcement provided by the surface layer.

46.8 Introducing preform into mold by thermoforming operation (e.g., vacuum forming, etc.):
This subclass is indented under subclass 46.5. Processes wherein the surface to be coated or filled is subjected to deformation caused by heat and a pressure differential.

(1) Note. Included herein is vacuum forming, etc.

46.9 On a preform or solidified layer which is spherical, toroidal, or annular:
This subclass is indented under subclass 46.4. Processes wherein the preform or solidified layer is curvilinear.

(1) Note. Included herein are preforms or solidified layers which are circular, toroidal, annular, etc.

48 Including surface treatment of porous body:
This subclass is indented under subclass 41. Processes wherein the exterior or outside surface of a porous body is subjected to a chemical or physical treatment.

SEE OR SEARCH THIS CLASS, SUBCLASS:
232+, and 340+, for processes of treating nonporous bodies.

49 By treating occluded solids:
This subclass is indented under subclass 41. Processes in which the voids are formed by subjecting embedded solids to a treatment which changes the physical dimension or state of the solids and causes the space the solids previously occupied to be left as voids.

(1) Note. If the occluded solid is removed by changing it to a gas the process is here if the void is produced by the solid, rather than by the expansion of the gas. See subclass 51 for processes in which a generated gas forms the voids.

SEE OR SEARCH THIS CLASS, SUBCLASS:
51+, for processes in which embedded solids are changed to a gas and the expanding gas creates voids and see (1) Note above.

50 By mechanically introducing gas into material:
This subclass is indented under subclass 41. Processes in which a pore forming gas is introduced or forced by mechanical means into a plastic material before the molding and solidification operation.

(1) Note. Operations including shaping and solidification of a froth, per se, with no pore forming steps are classified below on manipulative molding steps and cross-referenced here when pertinent.

51 By gas forming or expanding:
This subclass is indented under subclass 41. Processes wherein the voids are formed or enlarged by occluded gas which may be generated or expanded.

52 Utilizing expansion retarder:
This subclass is indented under subclass 51. Processes wherein the expansion of the porous material is inhibited by the presence of a chemical or mechanical means other than mere confines of the mold, per se.

SEE OR SEARCH THIS CLASS, SUBCLASS:
55, for controlling expansion by volumetric mold capacity changes.

53 Liquid to gas phase change:
This subclass is indented under subclass 51. Processes in which the voids are formed by a liquid to gas change of state, i.e., vaporization of a liquid incorporated into the molding material.

54 Chemical blowing:
This subclass is indented under subclass 51. Processes in which the voids are formed by the generation of gas by a chemical reaction of gas producing reactants or agents incorporated in the molding material.

55 Plural or incremental expansion steps:
This subclass is indented under subclass 54. Processes in which the chemical blowing to produce the pores is effected in two or more stages or in which the expansion takes place by means of varying expansion space.

SEE OR SEARCH THIS CLASS, SUBCLASS:
52, for incremental expansion by means of an expansion retarder.

68 INCLUDING STEP OF GENERATING HEAT BY FRICTION:
This subclass is indented under the class definition. Processes where heat is produced by moving contact between surfaces of plural bodies.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 73 for processes of friction welding to unite or laminate plural bodies.

228, Metal Fusion Bonding, subclasses 112+ for a process of welding metals by friction.

69 TREATMENT OF MATERIAL BY VIBRATING, JARRING, OR AGITATING DURING SHAPING:

This subclass is indented under the class definition. Processes which include the step of applying or effecting an oscillation or to and fro movement to the article forming material in a mold, or to the molding surface, or applying a sudden impact to the mold.

(1) Note. For agglomerating of particles by agitating or tumbling, see this class, subclass 117 and the notes thereto.

(2) Note. Tamping, per se, is considered a form of pressure application only and is excluded from this subclass.

(3) Note. Processes including a sliding movement between a reciprocating mold and a concrete surface to give a trowelling effect are included herein.

(4) Note. Patents claiming "rapid" or "high frequency" vibration, per se, with no disclosure as to the particular frequencies employed will be placed herein. To complete a search, however, see this class subclasses 442+ and the definition and notes thereto, and see (3) Note above with reference to the use of sonic or supersonic wave energy in the process.

SEE OR SEARCH THIS CLASS, SUBCLASS:

9, for formation of particulate material from a molten or liquid mass by vibration or agitation.

117, and see (1) Note above.

442+, and see (4) Note, above.

SEE OR SEARCH CLASS:

164, Metal Founding, subclasses 71.1 and 477 of vibratorially treating metal casting material.

70 Continuously formed or indefinite length article:

This subclass is indented under subclass 69. Processes wherein the treated article is one formed in a continuous manner or is of a running or indefinite length.

SEE OR SEARCH THIS CLASS, SUBCLASS:

165+, for processes, per se, of forming continuous or indefinite length articles.

71 By reciprocating or vibrating mold:

This subclass is indented under subclass 69. Processes in which the mold and its contents are vibrated or in which there is a reciprocal motion between a moving mold surface and the material therein.

72 Diverse, sequential, or modulated:

This subclass is indented under subclass 71. Processes wherein said mold vibration or reciprocation is discontinuous; of varying intensity or the vibrations are of different character, one from the other.

73 RANDOM VARIEGATED COLORING DURING MOLDING:

This subclass is indented under the class definition. Processes wherein a random, haphazard coloring effect is obtained as a result of and during a shaping operation.

(1) Note. The color pattern of the product produced by this subclass is random usually because at least one of the components is rendered fluent by the shaping operation and there is random or uncontrolled flow of the coloring agent. Processes in which controlled pattern multicolored articles are made by compositing or molding plural materials may be found in subclasses 245+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

78, for processes including a dyeing step or the incorporation of dye susceptible material.

245+, and see (1) Note above.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, for compositions resembling marble by reason of the mere mixing of named ingredients.

118, Coating Apparatus, subclasses 402+ for apparatus for applying a marbled coating by means of a floating film of coating material.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 63 for processes of manually arranging differently colored or shaped discrete elements to form a design.

427, Coating Processes, subclasses 256+ for processes of forming nonuniform coatings.

428, Stock Material or Miscellaneous Articles, appropriate subclasses, for a stock material product in the form of a single or plural layer web or sheet which may have a random variegated color, especially subclasses 141+ for a textured or rough surface of variegated color.

74 Of surface portion only:

This subclass is indented under subclass 73. Processes wherein the variegated coloring occurs only in the surface portion of the article; i.e., does not extend entirely through the article.

75 By extrusion:

This subclass is indented under subclass 73. Processes wherein the variegated coloring is produced by forcing differently colored materials through a shaping orifice.

SEE OR SEARCH THIS CLASS, SUBCLASS:

176+, for processes of forming continuous or indefinite length articles, per se, by extrusion through a shaping orifice.

323, for processes of extruding finite articles, per se.

76 By calendering:

This subclass is indented under subclass 73. Processes wherein the variegated coloring is produced by sheeting differently colored materials between coacting rollers.

SEE OR SEARCH THIS CLASS, SUBCLASS:

175, for processes of forming a continuous or running length article, per se, by a calendering operation.

77 By compression in a closed mold cavity:

This subclass is indented under subclass 73. Processes wherein the molding operation which produces the random variegated coloring effect involves the application of pressure to the differently colored materials in a confined space.

78 WITH INCORPORATING DYE SUSCEPTIBLE MATERIAL OR DYEING WORKPIECE:

This subclass is indented under the class definition. Processes which include the step of (1) dyeing an article or workpiece or (2) incorporating a dye susceptible ingredient in the molding material.

(1) Note. The dye susceptible ingredient incorporated into the molding material is not in itself a colored ingredient or a dye, per se, but is capable of subsequent treatment or reaction to form a colored body, (e.g., vat or leuco dyes, mordants, etc.).

(2) Note. This subclass includes processes in which a dye susceptible material is incorporated into a spinning solution which is then spun or extruded into a coagulating bath which contains a reactant for the dye susceptible material to produce the color, even if the reactant is the only specific ingredient of the bath which is named.

SEE OR SEARCH THIS CLASS, SUBCLASS:

73+, for processes in which a random variegated effect is achieved during the molding or shaping operation.

132, for processes including the step of applying an indicia or design to the shaped article.
245+, for producing composite structure with multicolored surface.

SEE OR SEARCH CLASS:
8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, particularly subclasses 154, 489 and 497 and see the notes and search notes thereto. See also the main definitions to this Class 264, section II, A 2. For weighting or mordanting of materials classified therein, see Class 8, subclass 443. Processes which include a nominal or broadly recited molding step combined with the step of dyeing the formed or coagulated filament are provided for in Class 8.

79 WITH APPLICATION OR BARRIER FOR VOLATILE COMPONENT MATERIAL TO MOLDED ARTICLE SURFACE:
This subclass is indented under the class definition. Processes wherein the escape of a volatile component of a molded article composition through the surface of the article is prevented, minimized or slowed by the application of a relatively impermeable layer to said surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
129+, for processes including the step of coating the formed article which coating may act inherently to perform various functions.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 90 for use of a barrier layer to prevent migration or bleeding between laminae.

80 FLAME CONTACT OR RESHAPING BY HEAT DECOMPOSITION OF WORK:
This subclass is indented under the class definition. Processes wherein at least a portion of a preform is (1) subjected to direct contact by an open flame or (2) contacted by a heat which chemically decomposes a surface portion to shape the preform.

SEE OR SEARCH THIS CLASS, SUBCLASS:
29, for processes including a carbonizing step.
234+, for processes including subsequent temperature changes.
345+, for processes directed to treating shaped or solid articles by a temperature change.

SEE OR SEARCH CLASS:
8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 140 for processes of singeing or carbonizing of textiles.
29, Metal Working, subclass 423 for processes including discarding or destroying of material.
125, Stone Working, subclass 1 for flame cutting of stone-like materials.
144, Woodworking, subclasses 329+ for flame treatment of wood.
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 82 for flame treatment combined with a laminating step.
427, Coating Processes, subclasses 223+ for coating processes including flame contact.

81 GAS OR VAPOR DEPOSITION OF ARTICLE FORMING MATERIAL ONTO MOLD SURFACE:
This subclass is indented under the class definition. Processes wherein material employed in forming an article is applied to a shaping surface in a gaseous or vapor state.

SEE OR SEARCH THIS CLASS, SUBCLASS:
129+, for vapor depositing a coating on a surface of an article out of a mold.

SEE OR SEARCH CLASS:
164, Metal Founding, subclass 46 for metal deposition processes projecting vapor onto a shaping surface.
427, Coating Processes, subclasses 248.1+ for processes of coating with vapor, gas or smoke.

82 REACTIVE GAS OR VAPOR TREATMENT OF WORK:

This subclass is indented under the class definition. Processes in which a workpiece or molding material is subjected to treatment with an applied gas or vapor, which gas or vapor reacts chemically with at least the surface of the workpiece.

(1) Note. Processes in which steam generated by heating wet concrete would not bring a patent here. To be placed in this subclass steam or vapor must be added from an external source or be created from water other than that in the concrete.

SEE OR SEARCH THIS CLASS, SUBCLASS:

85, for processes utilizing an inert gaseous atmosphere.

232, for processes including subsequent disparate treatment of article after working, shaping or molding.

333, for mere heating of hydraulic inorganic settable materials.

340+, for treatment, per se, of shaped or solid articles.

643, for processes directed to firing, sintering or vitrifying of shaped articles or preforms with coating by vapor contacting said body after firing.

646+, for processes of utilizing a chemically reactive atmosphere other than air, per se, during sintering to convert precursor to ceramic material.

674+, for processes involving specified composition of heating atmosphere, other than air.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, appropriate subclasses for reactive steam treatment of inorganic materials when combined with a broadly recited molding step.

427, Coating Processes, subclasses 248.1+ for processes of coating with a vapor, gas, or smoke.

83 Work is organic material:

This subclass is indented under subclass 82. Processes wherein the work or material being reacted with a gas or vapor is an organic material.

84 APPLYING EXPLOSIVE FORCE TO MAKE ARTICLE:

This subclass is indented under the class definition. Processes wherein material is consolidated by an explosive force or detonation which produces a large sudden compacting pressure on said material.

85 UTILIZING SPECIAL INERT GASEOUS ATMOSPHERE OR FLUSHING MOLD WITH INERT LIQUID:

This subclass is indented under the class definition. Processes wherein (1) a named nonreactive gas is used as the environment for the shaping, working, or treating operation on a material or (2) the ambient atmosphere of a mold is replaced by a nonreactive liquid.

(1) Note. To be placed in this subclass as an original patent the invention claimed must specify a particular inert atmosphere such as, for example, nitrogen or carbon dioxide. The term “inert” alone in a claim is not sufficient to place the patent in this subclass. Also air and steam have been excluded from this subclass even though they may be claimed as inert materials.

SEE OR SEARCH THIS CLASS, SUBCLASS:

39, for solvent flushing a mold to dissolve contaminants from its surface.

65, for processes for firing or vitrifying wherein the composition of the atmosphere is controlled.

86 REMOVAL OF LIQUID COMPONENT OR CARRIER THROUGH POROUS MOLD SURFACE:

This subclass is indented under the class definition. Processes wherein a liquid component or liquid vehicle for a moldable material is removed or separated from the material through a foraminous shaping surface.

(1) Note. The shaping surface for this subclass may have holes extending therethrough as in the case of a perforated sheet, or the body of the mold may be absorbent as in the case of a porous plaster mold which will absorb water.

SEE OR SEARCH THIS CLASS, SUBCLASS:

91+, for processes for forming articles by uniting particles carried in a gas stream.

SEE OR SEARCH CLASS:

162, Paper Making and Fiber Liberation, appropriate subclasses, for forming fibrous felted products from slurries by draining the liquid carrier through a foraminous mold surface.

210, Liquid Purification or Separation, appropriate subclasses for processes for dewatering slurries to produce a formless mass of material.

87 By direct application of vacuum or pneumatic pressure:

This subclass is indented under subclass 86. Processes which include the use of pneumatic pressure or that created by a vacuum effect directly applied to the liquid to aid in removal of the liquid through the mold surface.

101 VACUUM TREATMENT OF WORK:

This subclass is indented under the class definition. Processes including the application of a reduced pressure, below atmospheric, to a workpiece or molding material to effect the chemical and/or physical properties or the condition thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:

87, 88+ and 335, for other art relating to the application of fluid pressure differential to the work.

102 To degas or prevent gas entrapment:

This subclass is indented under subclass 101. Processes in which the vacuum is directly applied to a element or material to remove trapped gases or prevent gases from being entrained or trapped in a workpiece or material.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 286 for utilizing a vacuum to remove trapped gases from between laminae.

103 WITH TWINING, PLYING, BRAIDING, OR TEXTILE FABRIC FORMATION:

This subclass is indented under the class definition. Processes which include a step of twining, braiding, plying or twisting multiple elements about each other or the step of textile fabric formation.

(1) Note. The fabric formation may be by weaving, knitting, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

295, for molding followed by a bending or twisting step and 339 for bending or twisting processes, per se.

SEE OR SEARCH CLASS:

28, Textiles: Manufacturing, and the various species classes related thereto, for textile operations, per se, not combined with a significant step for this class.

428, Stock Material or Miscellaneous Articles, subclasses 175+, 190, 193, and 196+ for a stock material product in the form of a single or plural layer web or sheet embodying mechanically interengaged strands or strand-portions (e.g., weave, or knit).

442, Fabric (Woven, Knitted, or Nonwoven Textile or Cloth, etc.), subclasses 181+ for a woven fabric and subclasses 304+ for a knit fabric.

104 FORMING ELECTRICAL ARTICLES BY SHAPING ELECTROCONDUCTIVE MATERIAL:

This subclass is indented under the class definition. Processes wherein a material which is capable of carrying an electric current is plastically shaped to form an article in which such electric current carrying function is utilized.

SEE OR SEARCH THIS CLASS, SUBCLASS:

171.1+, for processes of forming continuous or indefinite length stratified or layered articles around a strand-like or filament like preform.

272, for processes of encapsulating an electrical component in shaped material.

614+, for processes of forming electrical articles including the step of vitrification, sintering or firing of shaped inorganic preforms.

SEE OR SEARCH CLASS:

72, Metal Deforming, subclasses 253.1+ for making a metal wire or filament by die-extruding it.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 47+ for processes of making electrical conductors of indefinite length not otherwise provided for, see (2) Note therein.

204, Chemistry: Electrical and Wave Energy, subclasses 291+ for electrodes for electrolytic apparatus made of plastic compositions.

252, Compositions, subclasses 500+ for compositions specialized for use as electrical conductors or emitters or electrical devices for such use defined solely in terms of the compositions of which they are composed.

373, Industrial Electric Heating Furnaces, subclasses 88+ for electrodes for arc furnaces which are formed from plastic materials. Subclasses 592.1+ of Class 29 constitute the generic place for making electrical devices, including electrodes, from metal and include processes which include a metal working operation.

419, Power Metallurgy Processes, subclass 4 for processes of making filaments or fibers from metal containing powers by pressure and heat.

427, Coating Processes, subclasses 58+ for processes of forming electrical products by a coating operation.

445, Electric Lamp or Space Discharge Component or Device Manufacturing, subclasses 35+, 46+ and 60+ and the classes referred to in the notes thereto for other classes which provide for method an apparatus for making electrodes for electric lamp and electric space discharge devices.

105 Conductive carbon containing:

This subclass is indented under subclass 104. Processes wherein at least a part of the electroconductive material is conductive carbon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

29, for processes under the class definition which include a carbonizing step.

106 FORMING SOUND GROOVES IN RECORDS:

This subclass is indented under the class definition. Processes wherein an article has sound reproducing grooves formed on its surface by a molding operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

36, for processes of repairing or restoring articles for use which involve removal of the sound grooves in a record and appropriate subclasses under 239+ for molding operations which produce articles, per se, which may be disclosed to have utility in making sound producing records.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, subclass 37 for sound recording compositions, per se.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclass 68 for electroforming methods of producing sound records.

369, Dynamic Information Storage or Retrieval, subclasses 84+ for dynamic recording.

428, Stock Material or Miscellaneous Articles, subclasses 64.1+ for a disc which does not have the sound track.

520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Class 523, subclass 174 for a composition containing a synthetic resin or natural rubber having utility as a phonograph record molding composition or to processes of preparing said composition.

107 Die pressing disk type records:
This subclass is indented under subclass 106. Processes wherein the molding operation is performed on a solid preform to produce a disk-shaped record.

108 ORIENTING OR ALIGNING SOLID PARTICLES IN FLUENT MATRIX MATERIAL:
This subclass is indented under the class definition. Processes in which particulate material or filler in a flowable plastic mass is aligned, arranged or oriented while in said mass to give a desired physical effect.

SEE OR SEARCH THIS CLASS, SUBCLASS:
24, for processes in which electrical or wave energy is applied directly to fibers or other particulate material to move, align or effect deposition of said fibers or particles.
109+, for processes of randomly associating particles.

109 FORMING ARTICLES BY UNITING RANDOMLY ASSOCIATED PARTICLES:
This subclass is indented under the class definition. Processes directed to bonding to each other individually distinct particles which are associated randomly by bulk handling or deposition to form a layer containing a major amount of the particulate material.

(1) Note. The relative sizes of the particles are immaterial, however the particles must retain their discrete nature during the associating and bonding operation. Further, the mere presence of particles in a liquid carrier is not sufficient for this subclass (e.g., fillers or slurries), this being considered to be the molding of a fluent or liquid mass rather than the association of particles and is provided for in appropriate subclasses below.

(2) Note. The material is usually but not necessarily in the form of fibers or granules and bonding of the particulate material may be effected by applying an adhesive or by the latent adhesive characteristics of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
6, for processes of forming solid particulate material by liquid or melt comminuting combined with uniting of said bulk assembled or deposited particles.
91, for processes of applying vacuum or suction to bulk assembled particles.
131, for a molding process combined with a step of coating with particulate material.
239+, for processes of molding (1) plastic compositions containing particulate material as a filler; (2) colloidal or nonsettling dispersions, e.g., rubber latex or clay; and (3) plastic particulate material which lose their identity during molding to form a homogeneous product and see (1) Note above.

SEE OR SEARCH CLASS:
19, Textiles: Fiber Preparation, subclasses 144+ for a process of bringing particles together, for example by air laying, and see the notes in subclasses 144+ for the line between this class (264) and Class 19.
23, Chemistry: Physical Processes, subclasses 313+ for agglomerating processes provided for in that class.
44, Fuel and Related Compositions, subclasses 550+ for a solid fuel consolidation or shaping process which goes beyond mere molding of a starting composition, especially subclasses 596+ for a process which includes pressing using a specified condition or technique.
51, Abrasive Tool Making Process, Material, or Composition, for a process of making an abrasive tool, material, or composition for abrading purposes. Also see “Search Class" under the definition of Class 51 for related fields of search for preparing abrasive material stock.

65, Glass Manufacturing, subclasses 443+ for processes of forming glass fibers or filaments from a glass melt combined with coating, which may include adhesively bonding the fibers using any bonding medium or autogenously to form a glass fiber felt or mat; subclasses 36+ for processes of fusing glass fiber or particles to each other to form a felt. See also the main definition to this class (264) for further delineation of the line with Class 65.

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, see especially the notes thereto for the locus of other art relating to particle uniting and subclasses 228+ for a consolidated metal particle composition.

100, Presses, subclasses 35+ for a method of intermingling and/or deforming particulate material to mechanically unite the particles together at their respective interfaces without use of a binder.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 62.2 for a process of forming a felted article by simultaneously uniting of particles combined with the step of adhesively bonding the felted article to another part.

162, Paper Making and Fiber Liberation, subclasses 100+ for a process of forming an interfelted fibrous product, e.g., paper interfelted fibrous product, e.g., paper from a liquid fibrous suspension.

201, Distillation: Processes, Thermolytic, subclasses 5+ for a process for a mechanical pressing or briquetting of solid carbonaceous material combined with a thermolytic distillation operation.

419, Powder Metallurgy Processes, subclasses 61+ processes for making articles from metal particles by pressure without heat and subclass 1 for similar processes which use heat.

425, Plastic Articles or Earthenware Shaping or Treating: Apparatus, subclasses 80.1+ for corresponding apparatus.

427, Coating Processes, subclass 180 for processes of coating utilizing solid particles or fibers.

428, Stock Material or Miscellaneous Articles, subclass 87 for a product with a pile or nap type surface and including particulate matter, subclasses 143+ for a stock material in the form of a single or plural layer web or sheet which has a textured or rough surface comprising particulate matter, subclasses 323+ for a composite web or sheet including a component having structurally defined particles, and subclasses 402+ for structurally defined or coated particles.

110 Mica particles:

This subclass is indented under subclass 109. Processes wherein the particulate material is mica.

SEE OR SEARCH CLASS:

125, Stone Working, subclass 24, for a process of separating mica or mica-like materials along its line of cleavage.

241, Solid Material Comminution or Disintegration, subclass 4 for a process of comminuting or disintegrating micaceous material.

252, Compositions, subclass 378, for a process of exfoliating micaceous material.

428, Stock Material or Miscellaneous Articles, subclass 324, for a stock material product in the form of a single or plural layer web or sheet including a component comprising structurally defined mica, subclass 363 for a structurally defined mica flake or mass or layer thereof, and subclasses 454+ for a nonstructural composite sheet or web including a layer comprising mica.

112 Stratified or layered articles:

This subclass is indented under subclass 109. Processes directed to forming an article having plural layers by molding; at least one layer

being formed by bonding of randomly associated particles to each other.

SEE OR SEARCH THIS CLASS, SUBCLASS:

6, for processes of uniting particles including the step of formation of said particles from a molten or liquid mass, or other glass.

35, for forming composite structural installations in situ from inorganic hydraulic settable materials.

60, for forming a composite structure from particles combined with a firing step.

241, for processes of forming composite structures generally.

113 Plural layers formed by uniting randomly associated particles:

This subclass is indented under subclass 112. Processes which includes forming at least two distinct layers or strata of the formed article by a particle uniting operation.

(1) Note. A process of simultaneously forming two layers of particulate material and uniting them at their source of formation is within the scope of this subclass.

114 Utilizing centrifugal force:

This subclass is indented under subclass 109. Processes which include the use of centrifugal force.

SEE OR SEARCH THIS CLASS, SUBCLASS:

311, for a process of reshaping or molding other materials utilizing centrifugal force.

115 With liberating or forming of particles:

This subclass is indented under subclass 109. Processes including a step of initially forming the particles from nonparticulate material or liberating them from a fiber or particle containing material.

(1) Note. Included in this and indented subclasses are, for example, carding, grinding, cutting, etc., as well as forming particles by a molding operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

6, for processes including a step of forming particles from a molten or liquid mass other than glass.

SEE OR SEARCH CLASS:

19, Textiles: Fiber Preparation, subclasses .3+ for a process of severing filaments of indefinite length to produce discrete fibers.

65, Glass Manufacturing, subclasses 376+ for processes of forming glass fibers or filaments, particularly subclasses 443+ and 454+ for processes of forming glass fiber felt or mat by bulk assembly. For further delineation of the line between Class 65 and Class 264 see the class definition for Class 65, section III B.

162, Paper Making and Fiber Liberation, subclasses 1+ for processes of chemical liberation, recovery or purification of natural cellulose or fibrous material.

116 From felt or batt:

This subclass is indented under subclass 115. Processes in which the particles are liberated from a previously manufactured article of associated interfelted fibers.

SEE OR SEARCH THIS CLASS, SUBCLASS:

140+, for processes including a cutting step to form a flaked, shredded or pelleted product.

117 Agitating to form larger particles (i.e., accretion or agglomeration):

This subclass is indented under subclass 109. Processes directed to tumbling or otherwise agitating a mass of fine discrete particle to cause adherence of the particles to one another thereby producing larger size on particles.

(1) Note. The above process is usually referred to in the art as agglomeration or accretion.

SEE OR SEARCH CLASS:

23, Chemistry: Physical Processes, subclasses 313+ for a process of agglomerating finely divided solid nonmetallic elements or inorganic compounds to coalesce the elements or compounds not involving use of a binder which remains as part of the final product. The use of a fugitive binder, e.g., water would not exclude the process from Class 23.

71, Chemistry: Fertilizers, appropriate subclasses for processes of agglomerating fertilizer particles.

118 With subsequent cutting, grooving, breaking, or comminuting:

This subclass is indented under subclass 109. Processes which include the step of cutting, grooving, breaking or comminuting the article formed from the united particles.

SEE OR SEARCH THIS CLASS, SUBCLASS:

115, and 116, for processes pertaining to formation of particles which are subsequently united to form a final product.

138+, for a molding process combined with the step of mechanically removing material from a preform or forming a comminuted product.

140+, for processes including a cutting step to form a flaked, shredded or pelleted product.

SEE OR SEARCH CLASS:

241, Solid Material Comminution or Disintegration, appropriate subclasses, e.g., subclass 4 for comminuting of laminated or fibrous material and see sections 4 and 5 of the definitions of Class 241.

119 With reshaping or surface embossing of formed article:

This subclass is indented under subclass 109. Processes which include the step of reshaping or surface embossing the formed product.

SEE OR SEARCH THIS CLASS, SUBCLASS:

239+, for a process of mechanically shaping workpiece, particularly subclasses 284 and 293 for embossing and 320+ for reshaping solid work.

120 Plural, intermittent pressure applying:

This subclass is indented under subclass 109. Processes which include applying pressure (1) which varies stepwise in intensity or (2) intermittently or sequentially.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 312 for a laminating process including sequential different pressure applying steps.

121 Projecting particles in a moving gas stream:

This subclass is indented under subclass 109. Processes using a moving gas stream or current to convey particulate material onto a collecting surface.

SEE OR SEARCH CLASS:

19, Textiles: Fiber Preparation, subclasses 144+ and see the search note to Class 19 in subclass 109 of this class (264).

406, Conveyors: Fluid Current, subclass 197 miscellaneous processes involving conveying solid material with the assistance of a forced propelling fluid current.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 80.1+ for a molding apparatus comprising means utilizing an air current for randomly associating particulate material on a shaping surface.

122 Utilizing diverse solid particles:

This subclass is indented under subclass 109. Processes involving the use of (1) two or more kinds of particles differing in composition or (2) particles of the same composition but disclosed to be of different particle sizes.

(1) Note. Where particles of different composition are employed, these may bond autogenously at their surfaces, a liquid

binder or adhesive may be used or one of the kinds of particles may act as a binder by, for example, losing its identity as a particle by melting and flowing about or between the remaining solid particles.

(2) Note. Where different sizes of particles of similar composition are employed, said difference in size of the particles must be set out, since it is understood that normally in particles handled in mass or bulk, there will be minute differences in particle size although the overall appearance thereof would indicate homogeneity.

SEE OR SEARCH CLASS:
162, Paper Making and Fiber Liberation, subclasses 141+ for processes of uniting plural different fibers in a paper making operation.

123 Autogenously or by activation of dry coated particles:
This subclass is indented under subclass 109. Processes which include the step of treating the surface of particulate material and/or a dry adhesive coating previously applied to the particulate material, to render the surface of the material tacky thereby causing bonding of the individual particles to each other.

(1) Note. The particulate material, usually thermo-plastic, is treated with a fluid material which is not an adhesive, per se, and usually is a solvent for the material, or by the application of heat to render tacky the solid particulate material or dry coating thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
122, for processes in which plural different solid particles are united, one of which may act as an adhesive and which may or may not retain its particle identity on, for example, application of heat to activate it as an adhesive.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 308.2+ for an adhesive bonding process which includes tackifying the substance of a self-sustaining laminar to be bonded.

124 By activating naturally occurring binder (e.g., cork, etc.):
This subclass is indented under subclass 123. Processes which involves uniting particles containing a natural binder which under uniting conditions functions to bond the particles to each other.

(1) Note. In this subclass may be found, for example, patents relating to bonding cork particles.

125 Sintering or heat fusing particles:
This subclass is indented under subclass 123. Processes in which the autogenous bonding of the particles is effected by the application of heat with or without pressure.

(1) Note. Heat resulting from the application of pressure alone is not considered to be a positive application of heat. Also, some but not all of the particles may be melted; essentially the formed body must be of joined particles, not particles liquified by heat. Patents in which powdered or particulate material is completely melted are provided for in subclasses 239+ based on various manipulative molding steps.

SEE OR SEARCH THIS CLASS, SUBCLASS:
239+, and see (1) Note above.
603+, for a process of sintering a shaped inorganic preform external of a mold.

126 Of organic material:
This subclass is indented under subclass 125. Processes in which the particles or the dry coating thereof comprise organic material.

127 Fluorocarbon resin:
This subclass is indented under subclass 126. Processes in which the organic material is a fluorinated hydrocarbon resin.

128 Liquid binder applied subsequent to particle assembly:

This subclass is indented under subclass 109. Processes wherein a liquid adhesive is applied to the particulate material subsequent to the assembly, association or deposition thereof.

(1) Note. See the search notes in subclass 109 above pertaining to processes in which particulate material, e.g., fillers and binder material are mixed in a slurry prior to deposition thereof in a mold.

SEE OR SEARCH THIS CLASS, SUBCLASS:

123, for autogenous bonding of particles in which a liquid or solvent which is not, per se, an adhesive is employed to render the particles or surfaces thereof tacky or capable of adhesion.

122, for processes employing plural different solid particles one of which may act as an adhesive and which may or may not retain its identity as particle subsequent to uniting.

129, for molding combined with a coating step performed outside of the mold.

129 WITH PRINTING OR COATING OF WORKPIECE (OUT OF MOLD):

This subclass is indented under the class definition. Processes including the step of applying a layer of fluent material to the workpiece, which material is not restrained or confined by a mold or shaping surface.

(1) Note. For purposes of this subclass, application of a coating to a shaped article is generally outside of a mold. Where an added layer of material is applied to a previous layer while in the mold it is assumed that the layer is subjected to mold shaping and thus excluded, regardless of the thickness of said surface layer, unless there is a specific disclosure that the coating is unrestrained.

(2) Note. Treatment material, e.g., catalysts, solvents, softening materials such as water, etc., are not considered coatings or impregnants for this subclass.

(3) Note. The general line between this class (264) and Class 427, Coating Processes, with regard to processes of reshaping or deforming plus coating will be as follows:

a) Where a base is coated and the coating only is reshaped or deformed, the patent will go in Class 427.

b) Where a base is coated and the subsequent reshaping or deforming is applied to the coating and the contiguous surface to which the coating is applied, without an overall reshaping of the base and without altering the shape of any non-coated surface, the patent will go to Class 427.

c) Where a base is surface deformed only on one side or area so that there is no overall reshaping of the entire base, and the deformed surface is subsequently coated, the patent will go to Class 427.

d) Where a base is coated and there is subsequent overall reshaping of the resulting coated article or, when the base is in the form of a planar sheet or web, there is subsequent reshaping of both surfaces, e.g., corrugating, the patent will go to Class 264.

e) Where there is surface deformation of only one surface of a base, the opposed surface remaining unaltered, and the unaltered surface is coated, the patent will go to Class 264.

f) Where a base is reshaped overall or where opposing surfaces are reshaped, deformed, e.g., embossed, and then coated either on one or both deformed surfaces, the patent will go to Class 264.

g) Where a base is coated and subsequently said coated article is surface deformed, e.g., embossed through the coating and a portion of the base on opposed sides or surfaces, the patent will go to Class 264.

(4)Note. For nominal molding followed by a significant coating step see Class 427, Coating Processes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

7, for processes of forming solid particles liquids or melts combined with a coating step of said particles.

79, for processes including the step of applying a barrier layer to the surface of an article to prevent escape of volatiles.

128, for processes of assembling random, bulk deposited particles with subsequent application of liquid binder thereto.

232, for subsequent disparate treatment of formed articles.

255, for processes of forming plural layers in a mold, the surface layer being similar to a coating in the final product.

304, and 308, for processes in which plural layers of the same material are built up in the mold.

343, for swelling or plasticizing, per se.

603, for processes of firing, sintering or vitrifying of shaped articles or preforms having combined steps of shaping and coating.

SEE OR SEARCH CLASS:

428, Stock Material or Miscellaneous Articles, appropriate subclasses, for a stock material product in the form of a composite web or sheet, especially subclasses 411+ for plural layer products not elsewhere provided for.

442, Fabric (Woven, Knitted, or Nonwoven Textile or Cloth, etc.), subclasses 59+ for a coated or impregnated fabric.

130 Anti-stick or adhesion preventing coating

This subclass is indented under subclass 129. Processes wherein the coating has the function of preventing adhesion or sticking between the formed articles and/or adjacent material, surfaces or objects.

SEE OR SEARCH THIS CLASS, SUBCLASS:

264, for the use of an antiadhesion layer between layers in a compositing operation.

300, for processes in which a release agent is added to the molding material.

338, for processes in which a release agent is coated on a mold.

131 Coating with particulate material:

This subclass is indented under subclass 129. Processes in which the coating or printing material is applied as and remains in the form of particles.

SEE OR SEARCH THIS CLASS, SUBCLASS:

112, for processes of forming layered articles by molding randomly assembled particles.

130, for particulate coating of an antistick nature.

132 Applying indicia or design (e.g., printing, etc.):

This subclass is indented under subclass 129. Processes wherein the printing or coating is applied to the workpiece to provide planned ornamentation or intelligence at the surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

73+, for processes for forming random variegated colors during the molding operation.

245+, for processes of forming multi-colored surfaces by a compositing operation.

SEE OR SEARCH CLASS:

101, Printing, appropriate subclasses for printing, per se.

133 Applied to clay, sand, or earthen workpiece:

This subclass is indented under subclass 129. Processes wherein the base that is coated embodies a material containing clay, concrete, sand or other earthy material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

79, for coating siliceous or calcareous bases with a barrier layer to prevent or retard evaporation of a volatile component.

136, for coating processes in which base is glass fibers.

256, for processes of forming a layer in a mold on a body containing clay, sand or calcareous material which was formed in the same mold.

603+, for processes of firing, sintering or vitrifying of shaped articles or preforms having combined steps of shaping and coating outside of the mold prior to or subsequent to the firing steps.

134 Coating or impregnating workpiece before molding or shaping step:

This subclass is indented under subclass 129. Processes in which the workpiece has either a fluent layer applied to its surface by a coating operation or the interstices of a porous body are at least partially filled by said fluent material prior to a shaping operation.

135 Molding material against and uniting to the coated or impregnated workpiece:

This subclass is indented under subclass 134. Processes including the step of molding or shaping plastic material against the coated or impregnated preform and uniting said plastic material to said preform.

SEE OR SEARCH THIS CLASS, SUBCLASS:

171.1+, for processes in which plastic material is shaped against a preform to produce continuous or indefinite length articles.

241+, for processes for molding a plural part or composite article.

136 Impregnation of batt, sheet, or filament:

This subclass is indented under subclass 134. Processes which includes the step of applying fluent material to a fibrous, interfelted or porous preform so that at least a portion of the fluent material enters the interstices of the preform.

137 Heat settable impregnant:

This subclass is indented under subclass 136. Processes in which the fluent impregant is solidified by an increase in temperature.

138 WITH SEVERING, REMOVING MATERIAL FROM PREFORM MECHANICALLY, OR MECHANICALLY SUBDIVIDING WORKPIECE:

This subclass is indented under the class definition. Processes which include a step of 1) penetrating a shaped product from one face to another to cause at least a partial separation of the product, 2) tearing an article, 3) removing material from an article by means of a solid tool or implement, or 4) forming a comminuted product.

(1) Note. The formation of grooves and ridges in the surface of a workpiece resulting from a cutting separation of only the surface material does not come here but is placed in the appropriate subclasses below, e.g., subclasses 284 and 293.

(2) Note. For purposes of this subclass, the penetration need not necessarily be by a sharp tool but may be made by locally applied heat, for example.

(3) Note. Severing a mold charge from a fluent plastic bulk source is not considered cutting for this and indented subclasses.

(4) Note. To be placed herein, the operation must be performed on a shaped article or preform. Mixing, mulling, kneading of plastic materials are excluded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5+, for comminuting of liquids to form solid, particulate material.

118, for processes of uniting discrete bulk assembled particles including a subsequent cutting, grooving or comminuting step.

166, for processes of forming indefinite length articles including the step of comminuting or separating of a core only within an article.

284, and 293, for processes including a surface deformation, e.g., embossing and see the note in subclass 284.

678, for processes of firing, sintering, or vitrifying of shaped articles or preforms including a step of cutting, punching, or grinding.

SEE OR SEARCH CLASS:

83, Cutting, appropriate subclasses for processes of cutting, severing, perforating, etc., where not claimed in combination.

241, Solid Material Comminution or Disintegration, appropriate subclasses for processes for solid material comminuting and see particularly note 4 of the definitions to Class 241 for the line as to the combination of shaping plus comminuting.

139 Removing surface portion of composite workpiece to expose substrate:

This subclass is indented under subclass 138. Processes wherein a facing layer portion of a multilayered body is removed to expose an area of an underlying layer.

(1) Note. The facing layer may be removed to produce a decorative effect, by way of example.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 250+, appropriate subclasses, particularly subclass 270 for laminating combined with the step of cutting one lamina only.

140 To form particulate product (e.g., flakes, etc.):

This subclass is indented under subclass 138. Processes combined with the step of cutting or comminuting the formed product to produce flakes, shreds or pellets therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5+, for processes of forming particulate material directly from a molten or liquid mass.

116, for processes in which particulate material may be united to form a web or sheet followed by comminuting and reuniting of said comminuted particles.

SEE OR SEARCH CLASS:

241, Solid Material Comminution or Disintegration, appropriate subclasses and see section 4 of the definitions thereof as to the line between this class and Class 241 for the combination of shaping plus subsequent comminuting.

141 Subsequent to extruding step:

This subclass is indented under subclass 140. Processes where the flaked, shredded or pelleted product is formed from a material continuously extruded from a shaping orifice.

(1) Note. Where the cut-off product is of such size, length or character as to be handled as individual units, the process will be classified in subclasses 148+ below.

142 By cutting at point of extrusion:

This subclass is indented under subclass 141. Processes where a knife engaging the extrusion die face is moved across the extrusion orifice to cut the extruded material into the desired flakes, pellets or shreds.

143 From strands:

This subclass is indented under subclass 141. Processes where a continuously extruded filament is cut to short length fibers or “staples”.

SEE OR SEARCH THIS CLASS, SUBCLASS:

165+, for processes of forming indefinite length or continuous length articles, e.g., filaments, when not combined with a cutting step.

144 From continuously cast material:

This subclass is indented under subclass 140. Processes including the step of initially forming a continuous product by casting on a moving drum or belt.

(1) Note. As an example of the subject matter of this subclass is a process in which a plastic material is calendered, formed

as a sheet on one of the calender rolls, then removed in the form of flakes.

145 Forming continuous work followed by cutting:
This subclass is indented under subclass 138. Processes which include the prior step of forming a continuous or indefinite length article.

146 Slitting longitudinally:
This subclass is indented under subclass 145. Processes wherein the continuously formed work is slit parallel to the direction of movement.

147 Of web to form plurality of threads:
This subclass is indented under subclass 146. Processes where a continuously formed web is slit longitudinally into two or more filamentary or thread-like strips.

148 Extruding followed by cutting to length:
This subclass is indented under subclass 145. Processes wherein an extruded material is cut in a direction transverse to the direction of movement away from the extrusion die to produce discrete portions of a desired length.

SEE OR SEARCH THIS CLASS, SUBCLASS:
140+, for processes wherein the pieces of cutoff extruded material are of such small size as to be considered particulate, e.g., pellets fibers or staple fibers.

149 Extruding around moving preform:
This subclass is indented under subclass 148. Processes wherein plastic material is extruded around a core which moves with the shaped material thereon to the cutting station.

150 Extruding hollow product:
This subclass is indented under subclass 148. Processes wherein the product is elongated and hollow.

151 With shaping between extruding and cutting steps:
This subclass is indented under subclass 148. Processes wherein the extruded preform is reshaped before cutting to length.

(1) Note. Reshaping for the purpose of this subclass excludes stretching, since stretching conventionally accompanies extrusion.

152 Cutting and uniting cut parts:
This subclass is indented under subclass 138. Processes which includes a step of joining the severed portions or parts.

(1) Note. The joinder of the severed portions or parts may or may not be at the cut edges. As, for example, the slitting of the edges of a web or sheet and overlapping and securing the cut edges, or the splitting of a workpiece with subsequent reuniting with the cut faces exposed.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 250+ for cutting and laminating of plastic or the like cut parts or materials, e.g., subclass 251 pertaining to cut- seaming.

153 Punching article from sheet material:
This subclass is indented under subclass 138. Processes in which articles are severed from sheet material by a cutting action simultaneously on all areas being cut.

(1) Note. The article is usually severed by means of a configured cutting die.

154 Making hole or aperture in article:
This subclass is indented under subclass 138. Processes in which the operation involves either forming an aperture or opening (1) which does not completely penetrate the article and material is removed or (2) which completely penetrates the article with or without material removal therefrom.

(1) Note. Search subclasses 284 and 293 for embossing operations in which surface deformations are made in a preform which do not extend through the preform and no material is removed.

155 By punching or drilling:
This subclass is indented under subclass 154. Processes in which the opening or aperture is formed by a punching or drilling operation.

156 Plurality of holes:
This subclass is indented under subclass 155. Processes where two or more holes are formed in each article.

157 Dividing work to form plural articles:
This subclass is indented under subclass 138. Processes in which a workpiece is divided into two or more sections to form a plurality of articles.

(1) Note. Excluded from this subclass are processes punching plural articles from a sheet or web in which the sheet left after punching out the desired articles may be considered to be waste, or wherein the dividing is for the purpose of removing attached waste material, e.g., flash or sprue. The entire work blank must be utilized.

SEE OR SEARCH THIS CLASS, SUBCLASS:
153, for punching of plural articles from a sheet and subclass 161 for removal of flash or sprue.

158 Shaving or slicing sheets from work block:
This subclass is indented under subclass 157. Processes where the dividing consists of the cutting of relatively thin sheets from a work piece generally along a plane parallel to the major face of the produced sheet.

159 Tubular work:
This subclass is indented under subclass 157. Processes where the work piece is an elongated hollow article.

160 Sheet or web work:
This subclass is indented under subclass 157. Processes where the workpiece to be divided is in the form of a sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
153, for processes wherein plural articles are punched out from a sheet.

161 Flash or sprue removal type:
This subclass is indented under subclass 138. Processes where material removed from an article consists of (1) excess material forced out between meeting faces of a multipart closed mold and/or (2) excess material shaped by molding material admitting or injecting means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
37, for processes in which flash or trim is recycled or combined with additional molding material.

SEE OR SEARCH CLASS:
83, Cutting, for flash trimming processes when not combined with a molding step.
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, for removal of flash, trim or excess material when combined with a laminating operation.

162 Surface finishing (e.g., abrading, grinding, etc.)
This subclass is indented under subclass 138. Processes wherein an integral portion of the surface of a shaped preform is removed by a grinding, scraping, or abrasive action.

SEE OR SEARCH THIS CLASS, SUBCLASS:
284, and 293, for processes involving a surface deformation, e.g., embossing and see the note in subclass 284.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 153+ for a laminating process combined with an abrading step.
451, Abrading, subclasses 28+ for a process of abrading, and see the notes thereto for related fields of search.

163 Simultaneous severing and shaping, or severing while work remains on shaping surface
This subclass is indented under subclass 138. Processes in which the material separating operation is performed (1) while the same area

is being plastically reshaped or (2) while the plastically formed material is still in contact with the forming mold, die or surface.

164 UNCONFINED DRAWING OR EXTENDING OF A PLASTIC MASS TO MAKE ARTICLE:

This subclass is indented under the class definition. Processes wherein the article is formed by the free and unconfined pulling out of a plastic mass.

(1) Note. The surface configuration of the article formed is imparted solely by the extension and not by coaction of the plastic mass with a shape imparting mold surface.

(2) Note. Kneading or mulling operations, per se, e.g., taffy pulling type are not included herein in that a shaped article is not produced. See subclass 349 and the notes thereto for such subject matter.

SEE OR SEARCH THIS CLASS, SUBCLASS:

165+, for process of forming indefinite length work by other than unconfined extension of a plastic mass.

288+, and 291+, for processes relating to stretching, per se, of a previously shaped article.

349, for kneading or mulling operations and see (2) Note above.

165 FORMING CONTINUOUS OR INDEFINITE LENGTH WORK:

This subclass is indented under the class definition. Processes which are directed to the molding of a continuous, running or indefinite length body of which at least one molded element or component thereof is unitary in nature as is formed by an uninterrupted molding step.

(1) Note. Processes relating to forming of plural finite elements and combining these elements mechanically to each other to form a running length article, e.g., a chain or other mechanically interlocked article consisting of plural parts are classified elsewhere, see the note to subclass 242 below.

(2) Note. Processes wherein a continuous article of varying composition is produced by intermittent charges of molding material of varying composition in the forming device are included herein.

(3) Note. Where layered, stratified or plural element containing indefinite or continuous articles are produced, at least one element, layer or stratum must be unitary in structure as set out in the definition or (2) Note above.

(4) Note. The final article produced need not be of indefinite length, for example, forming a thread and winding the thread into a finite article is included here.

(5) Note. The line between this class (264) and Classes 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, and 427 Coating Processes, in regard to the fluid treatment of coagulated, extruded or otherwise shaped plastic materials is that fluid treatments of the formed structures, whether previously dried or not, as well as processes which recite broadly the mere fact of forming (without stating any significant forming step as would be included in this class under the definitions) combined with a significant subsequent fluid treatment are placed in either of Classes 8 or 427, in accordance with the line existing therebetween and set forth in the reference to Class 8 in the class definition of Class 427. See also the definitions to this class (264), and see the notes and search notes to subclasses 129, 188, 195, 196, 232, and 340 of this class (264).

SEE OR SEARCH THIS CLASS, SUBCLASS:

47, for continuous article formation combined with pore forming.

70, for processes of forming indefinite length article including a vibratory step.

73, for producing indefinite length article of a random or variegated color.

99, for processes wherein pneumatic pressure is applied to the inside of a continuously extruded hollow article.

145, for continuous formation combined with cutting.

242, for processes of forming composite plural part or multilayered articles wherein said parts are joined for relative movement, e.g., chain or interlock effect.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, particularly subclasses 167 and 243 for forming of continuous laminae combined with a laminating step.

425, Plastic Article or Earthenware Shaping or treating: Apparatus, appropriate subclasses for corresponding apparatus, especially subclasses 67+, for filament or film forming apparatus, subclass 224 for fluent stock casting apparatus for forming continuous lengths and subclasses 376.1+ for an extrusion shaping machine.

428, Stock Material or Miscellaneous Articles, subclasses 364+ for a filament of a particular size or shape, or coated.

166 With mold element formation or removal:

This subclass is indented under subclass 165. Processes including (1) a step of forming a mold or shaping element for the work or (2) a step of destroying a mold or shaping element subsequent to the molding step.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41+, for processes of pore forming in situ, e.g., 44, by burning out of a component.

171.1+, for forming a continuous length article by molding on or around discrete axially aligned preforms, which preform may be destroyed in part, or comminuted.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 155 for laminating processes including the step of destroying a transitory material or element.

167 Of varying cross-sectional area or with intermittent cross-sectional irregularity:

This subclass is indented under subclass 165. Processes wherein the formed article is nonuniform cross-sectionally throughout its length which may result from a gradual change in transverse dimensions or through intermittent or repeated irregularities therein, said article being of monolithic construction.

(1) Note. In this subclass may be found, for example, processes for producing filaments of irregular denier.

SEE OR SEARCH THIS CLASS, SUBCLASS:

171.1+, for framing continuous length articles which are stratified or layered even though cross-sectional area irregularities may exist through spaced elements thereon.

168 With crimping or crinkling of strands of filaments:

This subclass is indented under subclass 165. Processes wherein a crimped, creped or crinkled effect is imparted to the formed articles which may be from a physical treatment or inherently resulting from the ingredients and/or chemical processes employed in the article formation or subsequent thereto.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 117 for processes involving a chemical modification of textile materials to produce a wool like or crinkle effect.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 183 for laminating processes which include a creping, wrinkling or crinkling step, and subclasses 196+ for laminating processes including a permanent bending or reshaping of a self sustaining lamina.

162, Paper Making and Fiber Liberation, subclasses 111+ and 280+ for processes and apparatus for creping or crinkling paper-like webs or sheets while still wet from the forming operation.

169 With prevention of equipment fouling accumulations or deposits:

This subclass is indented under subclass 165. Processes which include steps for prevention or removal of incrustations and other equipment fouling accumulations.

SEE OR SEARCH THIS CLASS, SUBCLASS:

39, for processes involving treating or conditioning apparatus for use.

85, for processes including the step of flushing a mold with an inert fluid.

195, for subsequent chemical treatment of viscose articles which may be directed to a process for removal of contaminants therefrom.

170 By chemical additive to molding material or treating bath:

This subclass is indented under subclass 169. Processes wherein said fouling accumulations are prevented by means of an additive chemical agent or ingredient in the article forming material or in the forming or treating bath therefor.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, appropriate subclasses for employing a specific additive to a spinning solution to prevent clogging of spinnerettes. Where claims are drawn in such a manner that the anticlogging agent may be either the bath or spinning solution then the patent will be placed as an original in this class (264), and cross-reference to Class 106.

171.1 Layered, stratified transversely of length, or multiphase macrostructure containing material (e.g., conjugate, composite, islands-in-sea, sheath-core, etc.):

This subclass is indented under subclass 165. Processes directed to methods of forming indefinite or running length articles comprising plural diverse elements or components in a contiguous relationship in a cross-section taken through said article, said contiguity extending for at least a portion of the length of the article.

(1) Note**.** This subclass does not include the simultaneous extrusion of a plurality of filaments which are then merely gathered into a yarn or thread in a parallel or contiguous relationship.

(2) Note. Where discrete elements are axially aligned on a continuous base, said elements being either spaced or in butt relationship, the patent is properly classified in this subclass.

(3) Note. In the formation of indefinite length filaments, particularly viscose, filaments with differentiated “skin” and “core” which may be produced from a homogeneous material and such processes will be classified below in appropriate subclasses according to method or material employed.

(4) Note. Processes of forming “sheath-core” or “islands in the sea” composites, strands, or filaments are properly classified below in appropriate subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

73+, for forming a color variegated running or indefinite length article.

103, for gathering of extruded filaments into a yarn or thread.

135, for processes including coating or impregnating a preform combined with shaping against and uniting of plastic material to said preform.

167, for formation of continuous length articles of irregular cross-sectional area which are nonlayered or nonstratified, i.e., of monolithic construction.

252, for molding plural parts to an edge of a preform, e.g., slide fastener elements.

172.13, for composite, strand, or filament having island in the sea.

172.15, for sheath-core composites strands or filaments

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 167+ and 244.11+ for formation of a lamina or laminae by extrusion followed by adhesive bonding to form a laminate.

171.11 Including extrusion on or about plural discrete end-to-end or discrete side-by-side preforms (e.g., definite length preform, etc.):
This subclass is indented under subclass 171.1. Processes wherein a plurality of discrete preforms or bases of finite length are aligned in abutment or end-to-end relationship, not necessarily in physical contact, with formation of an indefinite or continuous layer of plastic material on or about said preforms.

SEE OR SEARCH THIS CLASS, SUBCLASS:
149, for processes of extruding a continuous length article around a moving preform with cutting thereof to length.
166, for processes of forming an indefinite length body in which a core mold or shaping surface may be formed or the core mold or shaping surface employed in the process is removed or destroyed, wherein at least for an interval of time, the mold and the molding material may be in a composite relationship.
323, for processes in which reshaping of a solid noncontinuous preform is effected by establishing a rubbing, wiping or sliding action between the preform and a shaping surface.

171.12 Hollow preform:
This subclass is indented under subclass 171.1. Processes wherein a hollow article or hollow stock material which is self sustaining is subjected to a shaping or reshaping operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
166, for processes in which a core mold may be formed or the core mold employed in the process is removed or destroyed, wherein at least for an interval of time, the mold and the molding material may be in a composite relationship.
171.26, for indefinite length hollow composites formed from nonhollow stock material.

SEE OR SEARCH CLASS:
427, Coating Processes, subclasses 230+ for processes of coating the interior of hollow articles.

171.13 Utilizing indefinite length preform:
This subclass is indented under subclass 171.1. Processes wherein a continuous, running, or indeterminate length preform is used.

171.14 Of metal:
This subclass is indented under subclass 171.13. Processes wherein the preform is pure metal or metal alloy or contains pure metal or metal alloy.

171.15 Natural rubber or thermosetting resin containing layer:
This subclass is indented under subclass 171.14. Processes wherein a layer contains material which is natural rubber or thermosetting resin.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, particularly Classes 523 and 524 for a synthetic resin or natural rubber composition which may be disclosed or claimed to possess utility as molding materials.

171.16 Utilizing plural metal preforms (e.g., twisted, spiral, etc.):
This subclass is indented under subclass 171.14. Processes wherein two or more metal containing preforms are used.

171.17 Shaping of plural layers on preform:
This subclass is indented under subclass 171.14. Processes wherein at least two layers are shaped or molded on the preform.

171.18 Sequential shaping of layers:
This subclass is indented under subclass 171.17. Processes wherein a second layer is formed subsequent to the previous layer.

171.19 Including upstream mixing:
This subclass is indented under subclass 171.14. Processes wherein mixing of components used to form a layer is conducted prior to shaping.

171.2 Producing coiled or helical containing structure or layer:

This subclass is indented under subclass 171.14. Processes wherein (a) the metal preform is either helical or coiled or (b) a helical or coiled layer is shaped to the metal preform.

171.21 Producing ribbon, tape, or sheet (e.g., extrusion, etc.):

This subclass is indented under subclass 171.14. Processes wherein the layered metal preform is a ribbon, tape, or sheet or is shaped to form a ribbon, tape, or sheet.

171.22 Including preheating of metal preform:

This subclass is indented under subclass 171.14. Processes wherein the metal preform is heated prior to having any layer shaped thereto.

171.23 Shaping of polyamide (e.g., nylon, etc.) or addition polymer of at least one monoethylenically unsaturated monomer (e.g., polyethylene, polypropylene, polystyrene, etc.) containing layer on preform:

This subclass is indented under subclass 171.13. Processes wherein a layer formed on the preform contains (a) polyamide or (b) addition polymer of at least one monoethylenically unsaturated monomer.

(1) Note. See the definitions of this Class 264 for the line between this class and the composition classes, especially Class 520.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, particularly Class 523 and Class 524 for a synthetic resin or natural rubber composition which may be disclosed or claimed to possess utility as molding materials.

171.24 Shaping of natural rubber or thermosetting resin containing layer on preform (e.g., elastomers, etc.):

This subclass is indented under subclass 171.13. Processes wherein a layer formed on the preform contains material which is either natural rubber or thermosetting resin.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, particularly Class 523 and Class 524 for a synthetic resin or natural rubber composition which may be disclosed or claimed to possess utility as molding materials.

171.25 Shaping of a natural resinous layer on preform (e.g., cellulosic, etc.):

This subclass is indented under subclass 171.13. Processes wherein a layer formed on the preform contains natural resinous material.

171.26 Producing hollow composite:

This subclass is indented under subclass 171.1. Processes wherein the composite formed is hollow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

166, for processes in which a core mold may be formed or the core mold employed in the process is removed or destroyed, wherein at least for an interval of time, the mold and the molding material may be in a composite relationship.

172.11, for processes of producing nonhollow composite stands, filaments or threads.

SEE OR SEARCH CLASS:

427, Coating Processes, subclasses 230+ for processes of coating the interior of hollow articles.

171.27 Having three or more layers of at least two different materials:

This subclass is indented under subclass 171.26. Processes directed to a hollow composite which has more than two layers wherein the material comprising at least one of the layers is dissimilar.

171.28 Polyamide (e.g., nylon, etc.) or addition polymer of at least one monoethylenically unsaturated monomer (e.g., polyethylene, polypropylene, polystyrene, etc.) containing layer:

This subclass is indented under subclass 171.26. Processes wherein the hollow composite has a layer which contains (a) polyamide

or (b) addition polymer of at least one monoethylenically unsaturated monomer.

(1) Note. See the definitions of this Class 264 for the line between this class and the composition classes, especially Class 520.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, particularly Class 523 and Class 524 for a synthetic resin or natural rubber composition which may be disclosed or claimed to possess utility as molding materials.

171.29 Including rotation of shaping surface or material being shaped:
This subclass is indented under subclass 171.26. Processes which comprise turning or revolving (a) a surface used to form or shape or (b) material being formed or shaped.

SEE OR SEARCH THIS CLASS, SUBCLASS:
209.2, for processes utilizing rotational or translational movement of a material shaping member on indefinite lengths excluding composites.
310, for processes excluding indefinite length composites in which rotating motion is imparted to the mold shaping surface or to the material being shaped.

172.1 Having particular noncircular cross-section (e.g., T-configured, etc.):
This subclass is indented under subclass 171.26. Processes wherein the hollow composite is cross-sectionally uniform and not circular (e.g., elliptical, star, hexagonal, dog-bone, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:
172.12, for processes of producing composite strand, filament, or thread with noncircular cross-section.

172.11 Producing composite strand, filament, or thread:
This subclass is indented under subclass 171.1. Processes directed to forming composites consisting of solid, singular, or plural, or twisted groups of slender, flexible, rodlike materials.

172.12 Having particular noncircular cross-section (e.g., T-configured, etc.):
This subclass is indented under subclass 172.11. Processes wherein the composite strand, filament or thread is cross-sectionally uniform and not circular (e.g., elliptical, star, hexagonal, dog-bone, etc.).

172.13 Islands-in-sea (i.e., discontinuous phase in continuous phase):
This subclass is indented under subclass 172.11. Processes directed to shaping a composite strand, filament or thread having a discontinuous phase material (island) and a continuous phase material (sea), usually of different composition.

(1) Note. The island phase material usually has a different melt index than the sea phase material. Extrusion or melt spinning are common shaping methods utilized in this subclass.

172.14 Side-by-side:
This subclass is indented under subclass 172.11. Processes wherein the composite strand, filament or thread is produced by forcing different materials through separate openings in a die or spinneret in which individual strands, filaments, or threads are formed adjacent one another.

172.15 Sheath-core:
This subclass is indented under subclass 172.11. Processes wherein the composite strand, filament or thread is produced by forcing different materials through separate openings in a die or spinneret in which one fiber or filament is substantially enclosed in the other (sheath-core type).

172.16 Into liquid bath (e.g., wet-spinning, etc.):
This subclass is indented under subclass 172.11. Processes wherein the composite strand, filament, or thread forming material is

forced through a shaping device or orifice into a liquid bath.

172.17 Melt-spinning:
This subclass is indented under subclass 172.11. Processes wherein the composite strand, filament, or thread is shaped by forcing a melt through an appropriately sized orifice.

172.18 Polyamide (e.g., nylon, etc.) or addition polymer of at least one monoethylenically unsaturated monomer (e.g., polyethylene, polypropylene, polystyrene, etc.) containing layer:
This subclass is indented under subclass 172.17. Processes wherein the composite strand, filament, or thread has a layer which contains (a) polyamide or (b) addition polymer of at least one monoethylenically unsaturated monomer.

(1) Note. See the definitions of this Class 264 for the line between this class and the composition classes, especially Class 520.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, particularly Classes 523 and 524 for a synthetic resin or natural rubber composition which may be disclosed or claimed to possess utility as molding materials.

172.19 Producing indefinite length article by depositing material on endless forming surface (e.g., endless belts, rollers, etc.):
This subclass is indented under subclass 171.1. Processes wherein an endless forming surface is used to shape an indefinite length article.

173.1 Including roller-type shaping surface (e.g., calendering, etc.):
This subclass is indented under subclass 172.19. Processes wherein the shaping surface is generally circular in cross-section and designed to rotate about an internal axis.

173.11 Having three or more layers of at least two different compositions:
This subclass is indented under subclass 171.1. Processes directed to forming a composite which has more than two layers wherein the material comprising at least one of the layers is dissimilar.

173.12 Melt extrusion (e.g., co-extrusion, etc.):
This subclass is indented under subclass 173.11. Processes wherein the multi-layered, indefinite length body is formed by forcing a melt through a confining orifice whereby the cross-sectional area of the extruded portion corresponds to the dimensions of the orifice.

173.13 Vinylidene chloride or fluoride containing layer:
This subclass is indented under subclass 173.12. Processes wherein at least one of the layers contains vinylidene chloride or vinylidene fluoride.

173.14 Polyamide (e.g., nylon, etc.) or addition polymer of at least one monoethylenically unsaturated monomer (e.g., polyethylene, polypropylene, polystyrene, etc.) containing layer:
This subclass is indented under subclass 173.12. Processes wherein at least one layer contains (a) polyamide or (b) addition polymer of at least one monoethylenically unsaturated monomer.

(1) Note. See the definitions of this Class 264 for the line between this class and the composition classes, especially Class 520.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, particularly Class 523 and Class 524 for a synthetic resin or natural rubber composition which may be disclosed or claimed to possess utility as molding materials.

173.15 Including subsequent reshaping (e.g., stretching, etc.):
This subclass is indented under subclass 173.12. Processes wherein the formed article is subjected to a deforming, (e.g., by plastic flow, bending, stretching, twisting, corrugating, etc.) so as to alter its overall shape.

173.16 Melt co-extrusion (e.g., two layers, etc.):
This subclass is indented under subclass 171.1. Processes wherein a layered indefinite length body is formed by forcing a melt through a

dual confining orifice whereby the cross-sectional area of the two extruded portions corresponds to the dimensions of the orifice.

173.17 Having particular noncircular cross-section (e.g., T-configured, etc.):
This subclass is indented under subclass 173.16. Processes wherein the co-extruded material is cross-sectionally uniform and not circular (e.g., elliptical, star, hexagonal, dog-bone, etc.).

173.18 HAVING COLORANT ADDED TO MATERIAL TO BE SHAPED OR PRODUCING TWO DIVERSELY COLORED LAYERS:
This subclass is indented under subclass 173.16. Process which includes (a) a step of incorporating a colorant (e.g., dye, pigment, etc.) directly in the shaping material such that an article is formed having at least one layer of nonrandom color, or (b) producing a layered article wherein each layer is of different color.

SEE OR SEARCH THIS CLASS, SUBCLASS:

73+, for processes in which a random variegated effect is achieved during the molding or shaping operation.

78, for processes including dyeing of a shaped article or preform, or including a step of incorporating a dye susceptible material (i.e., precursor) in the shaping material and followed by subsequent exposure to a reactant for the dye susceptible material to produce the color (e.g., such as found in a coagulant bath, etc.).

132, for processes including the step of applying an indicia or design to the shaped article.

245+, for reshaping processes for producing composite structure with multicolored surface.

173.19 Polyamide (e.g., nylon, etc.) or addition polymer of at least one monoethylenically unsaturated monomer (e.g., polyethylene, polypropylene, polystyrene, etc.) containing layer:
This subclass is indented under subclass 173.16. Processes wherein at least one layer contains (a) polyamide or (b) addition polymer of at least one monoethylenically unsaturated monomer.

(1) Note. See the definitions of this Class 264 for the line between this class and the composition classes, especially Class 520.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, particularly Class 523 and Class 524 for a synthetic resin or natural rubber composition which may be disclosed or claimed to possess utility as molding materials.

174.1 Styrene polymer containing:
This subclass is indented under subclass 173.19. Processes wherein the addition polymer is styrene containing.

174.11 Natural rubber or elastomer containing layer:
This subclass is indented under subclass 173.16. Processes wherein at least one of the co-extruded layers contains an elastomer or a natural rubber.

175 By calendering:
This subclass is indented under subclass 165. Processes in which the continuous product is produced from an unformed mass which is forced between a pair of coacting, continuously moving surfaces.

(1) Note. Included herein, for example, is shaping a mass by passing it between a pair of rolls, a roll and an endless belt or a pair of endless belts.

(2) Note. Where the patent discloses calendering of a previously formed indefinite length article, e.g., altering the thickness thereof by passing through pressure rolls, the patent will not be placed herein, since such an operation is considered to be a reshaping rather than an actual forming of a continuous or indefinite length article, see the search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

77, for calendering which produces a random variegated coloring effect.

212+, for casting of materials on a solid shaping surface in which a doctor knife may be employed for smoothing the upper surface of or regulating the thickness of the cast article.

280+, for mechanical shaping or molding of running or indefinite length work, per se.

176.1 Shaping by extrusion:

This subclass is indented under subclass 165. Processes wherein an article is shaped or formed by extruding or forcing a supply of the article forming material through a confining and shaping orifice

SEE OR SEARCH CLASS:

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 376.1+ for an extrusion shaping machine or nonmetals; see the search notes thereunder.

177.1 To produce particular cross-section (e.g., noncircular, etc.):

This subclass is indented under subclass 176. Processes wherein formation is by extrusion through an orifice so shaped as to produce solid, cross-sectionally uniform articles which are other than circular or linear in cross-section.

(1) Note. Extrusion through circular orifices or elongated linear slit orifices to produce conventional filaments, rods, films, sheet, etc., are classified on some other basis. To be placed herein, a patent must disclose the use of an extruding orifice of a particular cross-sectional shape to produce a shaped article other than those set out above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

167, for methods of producing articles of varying cross-sectional area or intermittent cross-sectional irregularity.

171.1+, for methods of producing transversely layered or stratified articles.

177.11 Nonresinous material only (e.g., ceramic, soap cellulose, glue, etc.):

This subclass is indented under subclass 177.1. Processes wherein the material being processed is other than a natural or a synthetic resin, e.g., ceramic material soap, cellulose, glue, etc.

(1) Note. This subclass is not intended to include synthetic resins which meet the definition of Class 520.

(2) Note. A process for extruding a nonresionus material wherein a resin binder is employed conventionally as an auxiliary agent is considered proper for this subclass.

177.12 Honeycomb:

This subclass is indented under subclass 177.1. Processes which produce a product with a honeycomb structure.

177.13 Filament (e.g., T-configured, dog-bone, trilobal, etc.):

This subclass is indented under subclass 177.1. Processes wherein the product produced is a filament or fiber having a particular cross-section, e.g., T-configured, dog-bone, trilobal, etc.

177.14 Hollow or tubular work produced:

This subclass is indented under subclass 177.13. Processes wherein a filament of hollow or tubular cross-section is produced.

177.15 Capillary passages (e.g., pen nibs, writing tip, etc.):

This subclass is indented under subclass 177.14. Processes wherein the product contains capillary passages, e.g., pen nibs, writing tips, etc.

177.16 Die configuration (other than fixed orifice shape):

This subclass is indented under subclass 177.1. Processes wherein the configuration of the extruder die is specified, other than merely the shape of a fixed die orifice, e.g., long land die, tapered die, plural distinct zones, etc.

177.17 Processing or treatment after extrusion (e.g., support, guide, etc.):
This subclass is indented under subclass 177.1. Processes wherein the the extrudate is further processed or treated in some manner, e.g., supported manipulated by means of a guide, reshaped, coagulated, etc.

177.18 Chemical:
This subclass is indented under subclass 177.17. Processes wherein the extrudate undergoes chemical treatment, e.g., curing, polymerization, etc.

177.19 Temperature specified (other than ambient):
This subclass is indented under subclass 177.17. Processes wherein temperature is employed to treat the extrudate, e.g., quenching, heat softening for reshaping, etc.

177.2 With reinforcement, filler, or additive:
This subclass is indented under subclass 177.1. Processes wherein the material extruded includes reinforcement, filler or another additive for a special use.

178 Into a liquid bath:
This subclass is indented under subclass 176. Processes wherein formation takes place by extrusion of the article forming material through a shaping device or orifice into a liquid bath.

(1) Note. This and indented subclasses include, for example, extruding into a cooling, heating or reactive bath.

SEE OR SEARCH THIS CLASS, SUBCLASS:
232+, and 244+, for subsequent treatment of formed articles.
298, for processes which include the step of casting finite articles on a liquid surface forming medium.

179 With purifying or replenishing of bath:
This subclass is indented under subclass 178. Processes wherein ingredients are added to or removed from the bath, or the bath is treated, so as to maintain the desired composition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
38, for processes reciting reclaiming or purifying and recycling of extrudant receiving bath material.

180 Liquid of bath is in motion:
This subclass is indented under subclass 178. Processes in which the liquid of said forming or receiving bath is in motion.

(1) Note. Incidental disturbance or movement of the liquid which may occur by the unconfined passage of a formed article therethrough is not sufficient to place a patent in this subclass. However, disclosure that the formed article in passing through a restricted tube placed in the bath whereby a current of liquid is created and carried therethrough by frictional contact with the formed article, is within the scope of this subclass.

181 With stretching in bath of extruded article :
This subclass is indented under subclass 180. Processes wherein the motion of the liquid induces or is concomitant with stretching therein of the formed article.

182 Polyacrylonitrile containing extrudant:
This subclass is indented under subclass 178. Processes wherein the material being shaped is polyacrylonitrile containing.

SEE OR SEARCH THIS CLASS, SUBCLASS:
206, for processes of forming indefinite length articles by an evaporative or drying step employing polyacrylonitrile in solution or dispersion.

183 Reactive bath:
This subclass is indented under subclass 178. Processes wherein the bath contains ingredients which react chemically with ingredients in the extruded forming material to coagulate, set or form the element or component.

(1) Note. See the class definition for the general line between this class and composition classes, per se. Where a patent claims only the precipitating or coagulating bath for use solely in formation of

indefinite length articles by extrusion of article forming material therein, the patent will go to this class as an original in the appropriate subclass based on the disclosure. Mere recitation of spinning a composition into a reactive bath broadly recited or an "acidic" reactive bath is not considered significant molding but recitation of the pH or pH range of the bath is considered significant.

SEE OR SEARCH THIS CLASS, SUBCLASS:

78, for processes in which a spinning solution containing a dye susceptible material or a material capable of forming a dye is extruded into a setting bath disclosed to contain a reactant capable of converting said material into a colored element.

203, for processes employing a solvent extractive bath.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, subclasses 162.1+, particularly subclasses 166.01+ for carbohydrate or derivative containing compositions which may be disclosed to have utility as spinning solutions and see the main line between this class (264) and the composition classes as set out in the class definitions of this class (264) which is relative to patents claiming a process of spinning a specific composition into a reactive bath, per se, or an "acidic" bath wherein none of the ingredients of said bath is named, or where no specific pH is recited.

184 Synthetic resin containing extrudant:

This subclass is indented under subclass 183. Processes in which the material being extruded contains a synthetic resin.

(1) Note. For the definition of "synthetic resin, per se", see Class 520, Synthetic Resins or Natural Rubbers, subclass 1.

SEE OR SEARCH THIS CLASS, SUBCLASS:

182, for processes employing polyacrylonitrile containing forming materials.

191+, for processes employing viscose spinning solutions which contain an added organic ingredient which ingredient may be resinifiable or polymerizable at a subsequent stage.

201, for processes employing natural rubber containing forming materials.

206, for evaporative formation of articles employing polyacrylonitrile containing materials.

185 Polyvinyl alcohol containing:

This subclass is indented under subclass 184. Processes in which the synthetic resin is polyvinyl alcohol.

186 Carbohydrate containing extrudant:

This subclass is indented under subclass 183. Processes in which the article forming solution contains a carbohydrate.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, subclasses 162.1+ for carbohydrate or derivative containing plastic compositions.

520, Synthetic Resins or Natural Rubbers, particularly Class 523, subclasses 447+ and 509, and Class 524, subclasses 9+, 27+, 716, and 732+ for a nonreactant carbohydrate or derivative admixed with a polymer proper for Class 520.

536, Organic Compounds, subclasses 1.1+ for carbohydrate compounds and derivatives thereof.

187 Cellulose derivatives:

This subclass is indented under subclass 186. Processes in which the carbohydrate is a cellulose derivative.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, subclasses 163.01+ for cellulose derivative plastic compositions, per se, which are disclosed to have utility as a spinning composition.

536, Organic Compounds, subclasses 30+ and 56+ for cellulose compounds and derivatives thereof.

188 Viscose:
This subclass is indented under subclass 187. Processes wherein the carbohydrate is viscose.

SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, subclasses 166.01+ for viscose containing compositions.
536, Organic Compounds, subclasses 60+ for production and treatment of viscose, per se.

189 Bath contains organic compound:
This subclass is indented under subclass 188. Processes in which the reactive or coagulating bath contains an organic compound.

(1) Note. Where the patent claims only the reactive or coagulating bath or composition thereof and the disclosure indicates the sole use of said bath is for the formation of viscose articles, the patent will be placed in this and/or the indented subclasses as an original.

190 Carbohydrate or protein:
This subclass is indented under subclass 189. Processes wherein the organic compound is a carbohydrate or protein.

191 Extrudant contains added organic compound:
This subclass is indented under subclass 188. Processes wherein the viscose solution contains an additional organic compound other than viscose.

SEE OR SEARCH THIS CLASS, SUBCLASS:
184, for processes employing spinning solutions which contain a synthetic resin composition.

SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, subclasses 166.1 through 166.7 for viscose compositions containing additional organic compounds.

192 Sulfur containing organic compound:
This subclass is indented under subclass 191. Processes wherein the added compound contains sulfur.

193 Polyethers (e.g., oxyalkylated compounds, etc.):
This subclass is indented under subclass 191. Processes wherein the added organic compound is a polyether.

194 Nitrogen containing organic compound:
This subclass is indented under subclass 191. Processes wherein the added organic compound contains nitrogen.

SEE OR SEARCH THIS CLASS, SUBCLASS:
193, for additives which are polyethers of nitrogen containing compounds, e.g., oxyalkylated amines.

195 Subsequent chemical treatment of formed articles:
This subclass is indented under subclass 188. Processes wherein the formed article is further treated with a chemically reactive agent.

(1) Note. The step of washing or dehydrating, with water or other nonchemically reactive liquid, is not included within the scope of this subclass but are classified on some other basis.

(2) Note. See the notes and search notes in subclass 165 which refer to fluid or coating treatments provided for in Classes 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, and Class 427, Coating Processes, respectively.

SEE OR SEARCH THIS CLASS, SUBCLASS:
129, for processes including a coating step outside of the mold.
196, for processes wherein the article is formed in two or more stages as by coagulating or regenerating in plural baths.

196 Plural step coagulating or regenerating:
This subclass is indented under subclass 188. Processes wherein the formation of the article takes place in two or more stages, employing either the same or different coagulating or generating baths, said plural baths containing

either similar or dissimilar coagulating or regenerating reagents.

SEE OR SEARCH THIS CLASS, SUBCLASS:
195, for subsequent chemical treatment of a formed article.

197 With stretching:
This subclass is indented under subclass 196. Processes wherein the formed article is stretched either between treatments in coagulating or regenerating baths or subsequent thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:
103, for twisting.
168, for crimping or crinkling.
198, for stretching of viscose articles and see the search notes thereto.

198 Mechanical treatment of articles (e.g, stretching, folding, deforming, etc.):
This subclass is indented under subclass 188. Processes wherein the formed viscose article is subjected to a subsequent mechanical working or shaping step.

(1) Note. Since stretching is a conventional operation in the formation of indefinite length articles, a search in appropriate subclasses above will be necessary where an article forming operation combined with a nominally recited stretching step is set out in a viscose process. However, a patent classified above disclosing or claiming a significant stretching step in a viscose process will be crossed here.

SEE OR SEARCH THIS CLASS, SUBCLASS:
197, for stretching of indefinite length viscose articles following a plural step coagulation or regeneration.
208, for stretching of cellulose articles formed by an evaporative method.
210, for stretching of articles formed by melt spinning.
288, for stretching of preformed running length work.

199 Cupro ammonium cellulose:
This subclass is indented under subclass 188. Processes wherein the cellulose derivative is cupro-ammonium cellulose.

SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, subclass 167.01 for cuprammonium cellulose compositions.

200 Cellulose acetate:
This subclass is indented under subclass 187. Processes wherein the cellulose derivative is an acetic acid ester of cellulose.

SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, subclasses 163.01+, appropriate subclasses for cellulose or cellulose derivative compositions, per se, within the class definitions, which may be disclosed to be suitable as spinning compositions or solutions.

201 Natural rubber containing extrudant:
This subclass is indented under subclass 183. Processes in which article forming material contains natural rubber.

SEE OR SEARCH THIS CLASS, SUBCLASS:
184, for production of indefinite length articles by extrusion of synthetic resinous containing material into a reactive bath wherein said material may be disclosed to be rubbery in nature.

202 Protein containing extrudant:
This subclass is indented under subclass 183. Processes wherein the article forming contains protein.

SEE OR SEARCH THIS CLASS, SUBCLASS:
340, for treatment of solid or shaped articles, per se, which may involve subsequent chemical treatment of a protein containing article.

203 Liquid is solvent extractive:
This subclass is indented under subclass 178. Processes wherein the article is formed by extraction of the solvent from an article form-

ing solution by the bath liquid on extrusion of said solution therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:
204+, for article formation by evaporation of a solvent subsequent to extrusion of a solution of article forming material.
298, for casting on a liquid shaping surface in production of finite articles.

204 Solidifying by evaporation of liquid solvent or liquid carrier:
This subclass is indented under subclass 176. Processes in which the article is formed by extrusion into an evaporative atmosphere of a solution of article forming material with subsequent solidification thereof, by removal of the solvent of said solution through evaporation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
5+, for processes of forming particles or fibers which may include evaporation of a carrier.
82+, for reactive gas or vapor treatment of work.
203, for processes wherein the solvent of the article forming material solution is removed by an extractive liquid in which said material is relatively insoluble.

SEE OR SEARCH CLASS:
159, Concentrating Evaporators, subclasses 47.1+ for processes which may involve spray or film formation by a concentrating step.

205 Synthetic resin containing spinning solutions:
This subclass is indented under subclass 204. Processes wherein the article forming material in solution is a synthetic resin.

(1) Note. For the definition of "synthetic resin, per se," see Class 520, Synthetic Resin or Natural Rubbers, subclass 1.

206 Polyacrylonitrile:
This subclass is indented under subclass 205. Processes wherein the synthetic resin is polyacrylonitrile.

SEE OR SEARCH THIS CLASS, SUBCLASS:
182, for spinning of polyacrylonitrile solutions into a bath.

207 Cellulose derivative:
This subclass is indented under subclass 204. Processes wherein the article forming material in solution is cellulose or derivatives thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
187+, for processes of spinning cellulose derivatives into a reactive liquid bath.

208 With stretching of formed article:
This subclass is indented under subclass 207. Processes wherein the formed articles are stretched or elongated.

(1) Note. See the search notes to subclass 210 herein for the complete field of search involving stretching or reshaping.

209.1 Hollow article:
This subclass is indented under subclass 176. Processes wherein the article produced is hollow.

SEE OR SEARCH THIS CLASS, SUBCLASS:
150, for forming continuous hollow work by extruding, followed by cutting to length.
166, for forming continuous or indefinite length articles combined with mold or core formation or destruction, removal, comminution, or separation of mold core or preform.
173, for forming indefinite length composite or stratified hollow articles.
177, for forming indefinite length articles of particular noncircular cross section.
514, 515 and 563, for direct application of fluid pressure or vacuum to hollow work to permanently shape, distort, or sustain work.

209.2 Including rotational or translational movement of a material shaping member:
This subclass is indented under subclass 209.1. Processs including rotational or translational movement of a material shaping member in the extruding step.

209.3 Reshaping product (extrudate) subsequent to extrusion:
This subclass is indented under subclass 209.1. Processes wherein the extruded material is reshaped in some manner subsequent to extrusion.

209.4 Sizing to desired dimension:
This subclass is indented under subclass 209.3. Processes wherein extruded product is reshaped to achieve specific dimensions.

(1) Note. For example, an extruded tube may be reshaped to a specific diameter or wall thickness.

(2) Note. To reshape to different configuration is not considered to be sizing, e.g., changing from a tubular shape to a rectangular shape is not sizing.

209.5 Stretching extruded material:
This subclass is indented under subclass 209.4. Processes wherein the extruded material is reshaped by stretching to desired dimensions.

209.6 Curing or polymerizing operation during extrusion (e.g., cross-linking, vulcanizing, etc.):
This subclass is indented under subclass 209.1. Processes wherein at least some of the material being shaped is polymerized or cured, e.g., cross-linked, vulcanized, etc., during the extrusion.

(1) Note. Cross-linking herein includes cross-linking of thermoplastic as well as thermosetting materials.

209.7 At least two distinct operational temperatures employed during the extrusion operation:
This subclass is indented under subclass 209.1. Processes wherein at least two different temperatures are used at some point or time during the extrusion of the material.

(1) Note. A different temperature applied to the material subsequent to extrusion from the die is not sufficient to place in this subclass.

(2) Note. A different temperature at the outer wall of the extruder from the temperature of the inner (mandrel) wall is sufficient for this subclass.

209.8 Providing special flow channel feature (e.g., varying dimension of flow channel or varying direction of flow of material in the extruder, etc.):
This subclass is indented under subclass 209.1. Processes wherein special features of the flow channel in the extruder are included, e.g., varying dimensions of the flow channel or varying the direction of flow of material in the extruder, etc.

210.1 And reshaping:
This subclass is indented under subclass 176. Process which includes the additional step of stretching or permanently reshaping the formed article.

(1) Note. Classification of patents in this and indented subclasses. Patents should not be cross-referenced to this or its indented subclasses on the basis of disclosure, unless an unusual feature of the extrusion step or an unusual interrelationship between the extrusion and reforming steps is disclosed. Subclasses 239+ provide more specifically for molding and reshaping operations and are the preferred loci for such disclosures.

SEE OR SEARCH THIS CLASS, SUBCLASS:

103, for twining or plying.
119, for cutting combined with extruding and reshaping.
138+, for a process wherein stretching causes a tearing of the workpiece.
154, for pore formation due to stretching.
168, for crimping or crinkling of indefinite length articles.
181, for stretching of indefinite length articles in liquid in motion.

197, and 198, for stretching or deforming of indefinite length viscose articles.
208, for stretching of cellulose derivative articles formed by extrusion and solvent evaporation.
239+, for reforming of shaped articles, per se.
500+, for reshaping or distortion of work employing vacuum or fluid pressure.

210.2 Including a step other than application or removal of tension:

This subclass is indented under subclass 210.1. Process in which some or all of the reshaping is due to a force other than tension, e.g., pressure, etc.

(1) Note. The pressure must do more than merely hold the workpiece, establish a neck-down point, etc.

(2) Note. The process may also include a sequential operation wherein tension is applied or removed, or a simultaneous application or removal of tension, when it is clear that the reshaping is partly due to each mechanism.

SEE OR SEARCH THIS CLASS, SUBCLASS:

103, for a process which includes textile formation.
280+, for reshaping in general of running or indefinite length plastic materials.
500+, for a process where reshaping uses fluid pressure, e.g., blowing, etc.
555+, for reshaping running length work by such a procedure.

210.3 With application of agent other than water or air to workpiece:

This subclass is indented under subclass 210.1. Process wherein the workpiece, after extrusion, and before, during, or after reshaping, in contacted with a material other than air or water (including steam, water vapor, etc.).

(1) Note. The agent may remain with the workpiece or may be used merely for heating, cooling, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

78, for dyeing of a workpiece.
82+, for reactive gas or vapor treatment of a workpiece.
129+, for printing or coating a workpiece outside the mold.
178+, for extrusion into a liquid bath.
289.3, for processes similar to those contained in this subclass but without an extrusion step.

SEE OR SEARCH CLASS:

428, Stock Material or Miscellaneous Articles, subclasses 375+ and 411+ for coated, e.g., lubricated, etc., fibers and sheets, respectively, per se.

210.4 During or after final shape change:

This subclass is indented under subclass 210.3. Process wherein the application takes place during the final shape change, e.g., by spraying with inert liquid while shrinking, etc., or after the final shape change.

SEE OR SEARCH THIS CLASS, SUBCLASS:

232+, for a process of shaping and after-treatment of an article outside the shaping device without an extrusion step.
289.6, for processes similar to those contained in this subclass but without an extrusion step.
340+, for nonshaping treatments, per se.

210.5 With temperature gradient across cross-section of workpiece or heat treatment after all shaping:

This subclass is indented under subclass 210.1. Process wherein a workpiece having its final shape is heated or held at an elevated temperature, whether in or out of the mold; or wherein the heating or cooling of a workpiece is nonuniform across the cross-section of the workpiece, e.g., the edges of a moving web are held at a temperature lower than the central portion, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

25+, for a shaping or molding process wherein the workpiece is heated by direct application of electrical or wave energy (e.g., infrared heat, etc.) to the work.

234+, and 235+, for other processes concerned with after-heating.

210.6 With processing before extrusion or inclusion of additive:

This subclass is indented under subclass 210.1. Process wherein the workpiece is stated to contain a --material not in itself plastic, e.g., a plasticizer, solvent, etc., or wherein a step is performed upon the material which is to become the workpiece before it is extruded, e.g., comminuting, adjusting viscosity, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

78, for a process wherein a dye or dye former is included in the extrudant.

210.7 Plural stretching steps or stages:

This subclass is indented under subclass 210.1. Process wherein an extruded workpiece is subjected to stretching by tension in more than one stage.

(1) Note. Some criteria for determining when stretching occurs in more than one stage are the following: (a) The interposition of a nonstretching step, such as heating or shrinking between stretching steps, during which step no stretching occurs. (b) An abrupt change of stretching conditions, such as the tension force.

SEE OR SEARCH THIS CLASS, SUBCLASS:

138+, for a process wherein the stretching is followed by removal of part of the workpiece.

210.8 Of filament:

This subclass is indented under subclass 210.1. Process wherein the material extruded and reshaped is elongate material having a width about equal to its thickness.

(1) Note. The fibers may be individual monofilaments or may be bundled together as a yarn or tow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

210.7, for filament extrusion plus stretching in a plurality of stages.

290.5+, for filament stretching where no extrusion is claimed.

211 Utilizing added agent (e.g., flux, plasticizer, dispersing agent, etc.):

This subclass is indented under subclass 176. Processes wherein the article forming material contains and added (1) nonarticle forming agent or (2) agent chemically modifying the article forming material.

(1) Note. The added agent may be, for example, flux lubricant, plasticizer, or a dispersing agent such as a small amount of solvent insufficient to form a liquid solution thereof.

211.1 Centripetal extrusion:

This subclass is indented under subclass 176.1. Processes wherein centripetal force is employed to convey the article forming material.

(1) Note. A method utilizing the normal force developed when a visco-elastic material is sheared between a rotating plate and a stationary plate, having a central orifice, to cause centripetal flow of the material between the disc and orifice and issuance in plasticized condition from the orifice is proper subject matter for this subclass.

211.11 Nonresinous material only (e.g., ceramic soap, cellulose, etc.):

This subclass is indented under subclass 176.1. Processes wherein the material being processed is other than a natural or a synthetic resin, e.g., ceramic material, soap, cellulose material, etc.

(1) Note. This subclass is not intended to include synthetic resins which meet the definition of Class 520.

211.12 Processing or treatment after extrusion:

This subclass is indented under subclass 176.1. Processes wherein the extruded material is subsequently manipulated, reacted or otherwise processed after extrusion.

(1) Note. Contain of the extend material with guides or windup devices render a method proper for this subclass.

211.13 Contact of extrudate with fluid other than ambient air:
This subclass is indented under subclass 211.12. Process wherein the extrudate is contacted with a fluid, other than ambient air, in order to manipulate, influence the temperature of, or otherwise affect the product.

211.14 Filament (e.g., fiber, etc.):
This subclass is indented under subclass 211.13. Processes wherein the product is a filament or fiber type of article.

211.15 Plural treatment stages or zones:
This subclass is indented under subclass 211.14. Processes wherein the extrudate is treated in at least two different zone or stages, at least one of the treatments being with a fluid.

211.16 Extractive fluid or effects reaction:
This subclass is indented under subclass 211.14. Processes wherein the fluid extracts a component of the extrudate or effects a reaction in the extrudate.

SEE OR SEARCH THIS CLASS, SUBCLASS:
82+, for a process wherein a gas or vapor reacts chemically with at least a portion of the extrudate.

211.17 Heating:
This subclass is indented under subclass 211.14. Processes wherein the fluid treatment acts to heat the extrudate.

211.18 Plural treatment stages or zones:
This subclass is indented under subclass 211.13. Processes wherein the extrudate is treated in at least two different zones or stages, at least one of the treatments being with a fluid.

211.19 Extactive fluid or effects reaction:
This subclass is indented under subclass 211.13. Processes wherein the fluid extracts a component of the extrudate or effects a reaction in the extrudate.

SEE OR SEARCH THIS CLASS, SUBCLASS:
82+, for a process wherein a gas or vapor reacts chemically with at least a portion of the extrudate.

211.2 Heating:
This subclass is indented under subclass 211.13. Processes wherein the fluid treatment acts to heat the extrudate.

211.21 Screw extruder or screw feeder device:
This subclass is indented under subclass 176.1. Processes wherein a screw device is employed in the extruder or as a feeder or material worker for the extruder.

211.22 Filament (e.g., fiber, etc.):
This subclass is indented under subclass 211.21. Processes wherein the product is a filament or fiber.

211.23 Plural screws, plural screw extruders, or plural stage extruder:
This subclass is indented under subclass 211.21. Processes wherein the extruder employs more than one screw; more than one screw extruder; or plural different stages.

(1) Note. Extruders using different temperatures in different zones, or having threads of different pitch in different zones are proper for this subclass.

211.24 Curing or polymerization in the extruder (includes incomplete polymerization or curing or coagulating rubber):
This subclass is indented under subclass 176.1. Processes wherein some curing or polymerization reaction, or coagulation of rubber, is indicated to take place in the extruder.

212 By casting liquids on a solid supporting or shaping surface:
This subclass is indented under subclass 165. Processes wherein the indefinite length article is formed by depositing forming material in liquid form on a solid forming surface and solidifying the liquid to form the article.

(1) Note. The use of a doctor knife to smooth the upper surface of the cast liquid layer or to adjust the thickness thereof is considered to be within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

175, for processes wherein the article is formed between a pair of pressure rolls or moving pressure surfaces.

298, for casting finite articles on a liquid forming surface.

SEE OR SEARCH CLASS:

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 224 for corresponding apparatus.

213 Utilizing surface parting, anti-stick or release agent:

This subclass is indented under subclass 212. Processes in which removal of the formed article from the forming surface is facilitated by the use of anti-stick or adhesion preventing materials.

SEE OR SEARCH THIS CLASS, SUBCLASS:

130, for application of an anti-stick or adhesion preventing coating to a workpiece out of the mold.

338, for adhesion preventing coating of a mold is finite length article production.

214 To form nonplanar article or surface:

This subclass is indented under subclass 212. Processes wherein the article formed is nonplanar.

(1) Note. Included herein are, for example, filaments and tubes or films, webs and sheets which have at least one surface which is nonplanar.

215 By dipping the forming surface into the forming material:

This subclass is indented under subclass 212. Processes wherein the forming surface is dipped or immersed in a supply of liquid forming material to acquire the deposit of the necessary layer of said material thereon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

301+, for casting by accretion from bulk, e.g., subclass 305, for successive dipping steps into same material.

SEE OR SEARCH CLASS:

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 269+ for corresponding apparatus.

427, Coating Processes, subclasses 430.1+ for processes of coating by immersion.

216 Rubber or synthetic resin containing liquid:

This subclass is indented under subclass 212. Processes wherein the article forming material is rubber or synthetic resin containing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

205+, for extruding synthetic resin containing spinning solutions with solidifying by evaporation of liquid solvent.

SEE OR SEARCH CLASS:

520, Synthetic Resins or Natural Rubbers, subclass 1, for a definition of “rubber or synthetic resin”.

217 Carbohydrate containing liquid:

This subclass is indented under subclass 212. Processes wherein the cast liquid contains a carbohydrate as the article forming ingredient.

218 Solidifying by applied reagent:

This subclass is indented under subclass 217. Processes in which the cast article is precipitated, coagulated or made self sustaining by a subsequent treatment while on the casting surface either by an added reactant applied thereto or in a liquid precipitating or coagulating body.

SEE OR SEARCH THIS CLASS, SUBCLASS:

183+, for article formation by extruding through a shaping orifice into a reactive bath.

307, for processes including the treatment of accreted material on a shaping surface with added agent or reactant.

219 WITH STEP OF MAKING MOLD OR MOLD SHAPING, PER SE:

This subclass is indented under the class definition. Processes which include the step of producing (1) a shaping or molding device either as a, per se, operation by a method within the

definitions of this class or (2) in combination with a step of employing said shaping or molding device in the production of a molded product by a process classifiable in this class in which latter instance the molding or shaping device may be formed by methods provided for elsewhere.

(1) Note. Patents reciting merely the application or formation of mold linings on molding surfaces are not within the scope of this subclass and are classified on some other bases.

(2) Note. Patents reciting processes for manufacturing or assembling molds not specifically provided for herein are classified in various other classes depending on the specific manufacturing step employed, e.g., Class 29, Metal Working, Class 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

31+, for processes of erecting molds and casting structural installations in situ.

337+, for processes which employ specific mold materials or specific mold coatings or linings.

SEE OR SEARCH CLASS:

164, Metal Founding, subclasses 6+ for processes of making molds under the class definition.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclasses 69 and 70 for processes of electroforming printing plates, molds and the like.

220 Utilizing surface to be reproduced as an impression pattern:

This subclass is indented under subclass 219. Processes in which an area or shape to be duplicated is employed to form or produce a duplicating pattern or mold surface.

221 With destruction of pattern or mold to dissociate:

This subclass is indented under subclass 220. Processes in which the mold or a portion thereof is destroyed, dissolved, or broken, so as to dissociate or release the formed article therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

313, for processes utilizing a flexible, deformable or destructible molding surface or material.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 423+ for processes employing transitory or temporary material or parts.

222 Anatomical surface (i.e., using body area as an impression pattern):

This subclass is indented under subclass 220. Processes wherein some portion of the body surface of an animal is employed as a molding surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

16+, for dental casting and molding.

313+, for processes employing a flexible deformable or destructible molding surface or material.

SEE OR SEARCH CLASS:

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 2 for shaping apparatus utilizing an anatomical body or portion thereof as a shaping surface.

427, Coating Processes, subclass 1 for processes of body member printing, e.g., fingerprinting.

223 Pedal:

This subclass is indented under subclass 222. Processes wherein the body surface is that of a foot or leg.

224 With flexible inversion of a forming surface:

This subclass is indented under subclass 220. Processes in which a surface which is to be reproduced either in making a molding form or

a final article is inverted inside out by resilient flexing or deforming.

225 Forming mold from fluent material:
This subclass is indented under subclass 220. Processes in which the mold forming material employed in reproducing a surface is in a fluent state.

226 With initial molding or treating of a surface to be reproduced:
This subclass is indented under subclass 225. Processes in which the forming area to be reproduced is formed by a molding operation or is treated or conditioned to facilitate such reproduction.

227 Developing a surface negative and then a surface positive mold:
This subclass is indented under subclass 226. Processes which includes a formation of a negative of the surface to be reproduced followed by a formation of a positive surface which is to be used itself as a pattern or mold.

228 FORMING STRESSED CONCRETE ARTICLES:
This subclass is indented under the class definition. Processes wherein a composite concrete article is formed in which the concrete component is under compressive stress.

SEE OR SEARCH THIS CLASS, SUBCLASS:

31, for processes of forming stressed concrete during in situ formation of a structural installation.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 446+ and especially subclass 452 for forming stressed concrete when the stressing element is applied to a self sustaining concrete body.

588, Hazardous or Toxic Waste Destruction or Containment, subclass 257 for the use of concrete in the containment of hazardous or toxic waste.

229 PRESTRESSING SOLID BODY AND UNITING IN STRESSED CONDITION
This subclass is indented under the class definition. Processes wherein a solid body is placed under stress and united to another body or mass of molded material while maintaining said stressed condition.

230 UTILIZING HEAT RELEASABLE STRESS TO RESHAPE SOLID WORKPIECE (E.G., ELASTIC MEMORY, ETC.):
This subclass is indented under the class definition. Processes wherein a solid body is under stress and has such stress removed by heat application with simultaneous reduction of at least one dimension to return or attempt to return the body to its original shape.

231 APPLYING TENSILE STRESS TO WORKPIECE DURING HEAT CURING:
This subclass is indented under the class definition. Processes wherein a molded or shaped article is held under tensile stress during heat curing.

232 DISPARATE TREATMENT OF ARTICLE SUBSEQUENT TO WORKING, MOLDING, OR SHAPING:
This subclass is indented under the class definition. Processes in which the formed article is subjected to a treatment after working, molding or shaping thereof, said treatment being other than or different from that required to work, mold or alter the shape of said article and performed after removal from the mold.

SEE OR SEARCH THIS CLASS, SUBCLASS:

39, for the cleaning or polishing of apparatus.

82, for processes including treatment with reactive gas or vapor.

129+, for printing or coating of the workpiece out of the mold.

195, for subsequent chemical treatment of indefinite length viscose articles and subclass 198 for mechanical treatment thereof.

238, for processes including a combined operation.

307, for processes of accretion from bulk including treatment of the accreted material while on the form with an added agent or reactant.

344, for processes of treating an article, per se, wherein entrained, occluded or adsorbed material, e.g., liquids are removed by application of heat or by solvent extraction.

SEE OR SEARCH CLASS:

34, Drying and Gas or Vapor Contact With Solids, appropriate subclasses for drying, per se, and see the line set out in the definitions of this class.

233 Washing of article:

This subclass is indented under subclass 232. Processes wherein said treatment is a liquid cleansing step which removes impurities by a physical or solvent action of said liquid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

49, for the dissolving out of solids to form a porous product.

344, for, per se, removal of material which is occluded, adsorbed on or dissolved in an article.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 147+ for fluid treatment of artificial fibers, e.g., working, per se.

134, Cleaning and Liquid Contact With Solids, appropriate subclasses as the generic home for cleaning processes.

234 Effecting temperature change:

This subclass is indented under subclass 232. Processes wherein the worked, shaped or molded material is subjected to a positively applied heating or cooling step after removal from the mold.

(1) Note. Normal return of material to ambient temperature is not sufficient to place a patent in this subclass.

(2) Note. Utilizing a support to maintain the shape of the molded body after removal from the mold is within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

80, for processes including a flame treatment.

344, for removal, per se, of entrained material from an article by the application of heat.

345, for temperature changes applied to a shaped or solid article, per se.

235 Annealing:

This subclass is indented under subclass 234. Processes wherein said temperature variation is a heating step for the purpose of annealing the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

346, for processes of annealing a shaped or solid article.

235.6 After stretching running or indefinite length work:

This subclass is indented under subclass 235. Process wherein the annealing is performed upon stretched work of indefinite length or work which moves through the treatment zone as it is being treated.

(1) Note. The purpose of the treatment usually is to “heat set” the crystalline orientation produced by the stretching operation.

(2) Note. The treatment is carried out at a tension (or lack of tension) different from the tension which causes the stretching; when performed at the same tension, the treatment is considered to be treatment “within the mold” and is classified with the stretching treatment.

(3) Note. Shrinking is considered a shape change; heat treatment to shrink is not classified here; see subclass 289.6.

SEE OR SEARCH THIS CLASS, SUBCLASS:

181, 198 and 210.1+, for extrusion and stretching whether or not followed by heat treatment.

288.4+, and 291+, for stretching processes, per se.

235.8 Biaxial stretching of film:

This subclass is indented under subclass 235.6. Process in which the stretching which precedes the annealing is performed in two perpendicular directions on planar material.

(1) Note. Where all claims of a patent, classified herein, require a post-stretching heat treatment, the patent is preferably not cross-referenced to subclass 290.2.

SEE OR SEARCH THIS CLASS, SUBCLASS:
290.2, for biaxial stretching of film, per se.

236 Completing vulcanization or polymerization:
This subclass is indented under subclass 234. Processes wherein the applied temperature variation is for the purpose of effecting a completion of vulcanization or polymerization of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
347, for processes of completing cure in a partially cure shaped or solid article.

SEE OR SEARCH CLASS:
520, Synthetic Resins or Natural Rubbers, particularly Class 525, subclasses 55+ for vulcanization of natural rubber.

237 Cooling:
This subclass is indented under subclass 234. Processes wherein a positive cooling or refrigerating step is applied to the material.

(1) Note. Normal cooling of a heated material to ambient temperature is not sufficient to place a patent in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
28, for processes including a cooling or freezing step of 0°C or below.
348, for cooling, per se, of a shaped or solid article.

238 COMBINED:
This subclass is indented under the class definition. Processes combined with a step which is, per se, (1) not provided for in this class and which (2) performs a function other than that utilized to perfect the plastic molding, shaping or working operations.

(1) Note. "Perfecting" the operations of this class include operations performed on the material or work piece in the shaping means, handling of the material to present it to the shaping means, compounding the material, and heating or cooling the material or workpiece in or out of the mold.

SEE OR SEARCH THIS CLASS, SUBCLASS:
232+, for processes including a subsequent disparate treatment after working, molding or shaping.
307, for processes of accretion from bulk including treatment of the accreted material with an added agent or reactant.
319+, for processes of applying heat combined with a shaping step and see especially subclass 329 for processes of heating and working prior to injection molding.
345+, for heating or cooling, per se.

239 MECHANICAL SHAPING OR MOLDING TO FORM OR REFORM SHAPED ARTICLE:
This subclass is indented under the class definition. Processes for (1) making a self-sustaining solid article or shape from a formless or flowable mass of material, or (2) altering the configuration or at least one dimension of a solid self-sustaining workpiece by the application of a distorting mechanical force thereto.

(1) Note. Included herein are patents to confining shaped preforms between pressure surfaces and subjecting them to heat and pressure even though no apparent shaping is involved, e.g., vulcanizing rubber articles in a confining mold.

SEE OR SEARCH THIS CLASS, SUBCLASS:
340+, for treating preforms without pressure means.

240 Separately introducing reacting materials into mold:
This subclass is indented under subclass 239. Processes in which at least two independent components of a reactive system are combined at the shaping surface.

(1) Note. For processes wherein a chemical reaction, blending or mixing takes place in a mold in the absence of significant molding operations, see the definitions of this class (264) which sets out the line with the chemical composition classes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

82+, for processes which include utilizing a reactive gas or vapor.

183, for processes of extruding into a reactive bath.

301+, accretion from bulk, for initially coating a form with a coagulating material then a material to be coagulated or vice versa.

646, for processes which include utilizing a reactive atmosphere other than air, per se, during sintering to convert precursor to ceramic materials.

241 To produce composite, plural part or multilayered article:

This subclass is indented under subclass 239. Processes in which different materials, portions or parts are brought into association and united by a mechanical shaping or molding operation.

(1) Note. For location in this subclass the product of such process must be: (a) the result of joining preformed parts with reshaping at the joining areas without destroying the identities of the preformed parts, (b) the result of placing one preform in a mold and adding fluent material, of different character or, (c) composed of clearly defined layers or parts. Resin impregnated felted batts assembled and pressed together to form a homogeneous article, for example, would not be placed in this or indented subclasses unless the patent clearly set forth that the product includes a line of demarcation between the layers. Woven layers, however, by their very nature, maintain their identity as layers when pressed together and would be included.

SEE OR SEARCH THIS CLASS, SUBCLASS:

31+, for processes of forming composite in situ installations.

45+, for composite article making including a pore-forming step.

112+, for processes of forming stratified or layered articles by uniting of discrete, bulk assembled particles.

171.1+, for processes of forming continuous or indefinite length articles which are transversely stratified or plural element containing.

305, for processes in which a shaping surface is successively dipped into the same material.

642+, for processes of forming a multilayered, impregnated, or composite structured product by firing, sintering, or vitrifying of a shaped inorganic preform outside of a mold.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 610.1+ for methods of making electrical resistors including both molding and metal working. For the combination of molding a preform plastic part followed by a mechanical assembly of the part to another part see Class 29, subclasses 428+.

65, Glass Manufacturing, subclasses 36+ for fusion bonding of glass to a formed part.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, appropriate subclasses for processes and apparatus of forming composite structures by laminating.

164, Metal Founding, subclasses 91+ for processes of forming composite articles by metal casting.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 110 for composite article making apparatus comprising a molding cavity and means to feed or support a preform.

427, Coating Processes, appropriate subclasses for processes of forming a composite article by a coating operation.

428, Stock Material or Miscellaneous Articles, appropriate subclasses for layered or composite articles not elsewhere provided for.

242 Joining parts for relative movement:
This subclass is indented under subclass 241. Processes in which the product formed is composed for parts united or joined by a shaping operation whereby said parts remain mechanically movable relative to each other.

SEE OR SEARCH CLASS:
164, Metal Founding, for processes of forming a product having interconnected movable parts by metal casting.

243 Bristled or tufted article making:
This subclass is indented under subclass 241. Processes directed to the production of bristle or tufted articles wherein substantially parallel fibers or filaments are fixed or positioned by a molding operation which causes a portion of said fibers or filaments to be embedded in a plastic material base.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 72 for processes wherein tufts or piles are set or embedded adhesively in or to a preformed backing.
300, Brush, Broom, and Mop Making, for brush or similar article forming procedures which may include a molding step.

244 Uniting shoe part to upper:
This subclass is indented under subclass 241. Processes in which material is molded or reshaped and united simultaneously with a preformed upper portion of a shoe or boot.

245 Multicolored surface:
This subclass is indented under subclass 241. Processes in which the surface of the composite articles has portions which are different in color than other surface portions.

SEE OR SEARCH THIS CLASS, SUBCLASS:
78, for dyeing or incorporating dye susceptible material.
139, for mechanical removal of surface portions of a composite to expose a substrate which can be of contrasting color to the surface.

246 One component self-sustaining prior to compositing:
This subclass is indented under subclass 245. Processes which include forming a composite by utilizing as one component in the forming operation a self-sustaining preform which forms a surface area that differs in color from at least one other surface area.

247 Positioning component in mold:
This subclass is indented under subclass 246. Processes in which the self-sustaining preform is placed in, or relocated to, a particular position within a mold prior to the compositing operation.

(1) Note. A component, which at the time of compositing thereof, lies undistributed adjacent a portion of the mold against which it was formed, is not considered to be positioned in the mold for purpose of this subclass, merely because other portions of the forming mold have been altered to form the composite mold configuration.

248 Fusion bonding of preformed bodies and shaping at joint only:
This subclass is indented under subclass 241. Processes wherein two plastically deformable self-sustaining bodies are assembled and autogenously united at a joint area by a shaping operation with plastic flow to reshape said bodies at said joint area.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 308.2+ and 324.4 for autogenous bonding of preforms, per se, in which any plastic flow at the joining area is incidental only to the joining operation and is not a shaping operation, per se, see subclass 69 for application of and closures to containers wherein there may be autogenous bonding at the joining area, and subclass 292 for joining preforms at edges with opposed surfaces out of contact.

249 Mechanically securing parts together by reshaping joint portion only:
This subclass is indented under subclass 241. Processes in which two self-sustaining preforms are locked or mechanically united together by a local reshaping of at least one of the preforms.

SEE OR SEARCH THIS CLASS, SUBCLASS:
273, for processes of embedding a porous preform in a molding material with the molding material extending through the holes in the preform.
274, embedding a preform in a molding material wherein said preform is provided with means to form a mechanical interlock with the shaped material.

SEE OR SEARCH CLASS:
29, Metal Working, appropriate subclasses for mechanical joining, per se, or obtaining a mechanical interlock by metal reshaping.

250 By separately molding different article portions:
This subclass is indented under subclass 241. Processes in which at least two different materials, portions or parts making up the composite article are separately molded or shaped.

(1) Note. Sequential pouring of plastic material layers of differing compositions or physical properties so as to form a composite article in the same mold is considered separate molding for purposes of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
31+, for processes of sequentially molding different portions of an in situ structure.
308, for sequential pouring of the same material or incremental molding of the same material to form a homogeneous body.

251 Spaced molded portions interconnected by solid preform:
This subclass is indented under subclass 250. Processes which include molding portions which are spaced from each other on, and separately united to, a preform or base by said molding operation.

252 Molding portions along sheet edge:
This subclass is indented under subclass 251. Processes in which the base is a sheet, film, web or batt and the molded portions are confined to and extend along an edge of such base.

SEE OR SEARCH THIS CLASS, SUBCLASS:
171.1+, for forming continuous or indefinite length composite or layered articles.

253 Building unit having spaced walls:
This subclass is indented under subclass 251. Processes in which the product is a building element or module of the type having two spaced walls interconnected by a preform element.

254 Separate stage covering of different preform areas:
This subclass is indented under subclass 250. Processes in which a body has different surface areas covered with material in separate shaping operations.

255 Sequential formation of portion on same mold or a preform surface:
This subclass is indented under subclass 250. Processes in which the same mold or confining means is used to retain the molding material during the formation of the different article portions.

(1) Note. Incremental molding or dip casting of different materials in or on the same mold is within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
129+, for molding processes including a coating step preformed prior or subsequent to the molding and outside of the mold.

301+, for sequential formation of layers of the same material on a mold by a accretion from bulk.

308, for sequential layer formations of the same material.

256 Utilizing clay, sand, or calcareous slurry :

This subclass is indented under subclass 255. Processes wherein a layer is comprised of a material which is in whole or part siliceous, argillaceous, arenaceous, calcarious or is formed substantially of a similar, common soil forming substituent.

257 One component is a fibrous or textile sheet, web, or batt:

This subclass is indented under subclass 241. Processes wherein one component of said composite article is a fibrous or textile sheet, web or batt.

SEE OR SEARCH THIS CLASS, SUBCLASS:

136, for similar operations which include coating or impregnating of a self-sustaining batt sheet or filament.

244, for processes of uniting shoe parts to upper in which one part is a textile sheet or batt.

252, for the molding of a material against a textile base in the forming of separable fasteners.

258 Joining a plurality of superposed fibrous or textile layers:

This subclass is indented under subclass 257. Processes in which a plurality of superposed or contacting fibrous or textile sheets, webs or batts are united at least in some areas of said contact.

259 Shaping material and uniting to a preform:

This subclass is indented under subclass 241. Processes in which a molding material is shaped or formed against a preform and said shaped material remains united with the preform to constitute a composite article.

(1) Note. Where the preform and the shaping material are the same composition so that the product is homogeneous and cannot be called composite, the patent will not be placed herein but will be classified in the appropriate subclass based on the manipulative steps involved.

SEE OR SEARCH THIS CLASS, SUBCLASS:

18, for processes of forming a denture base against preformed teeth.

30, for processes of uniting a furnace lining material to a furnace wall.

228, for shaping concrete and uniting to a preform self-sustaining body, (stressed concrete type).

308, for incremental layer molding of the same material.

260 Co-molding plural fluent materials and uniting to preform :

This subclass is indented under subclass 259. Processes wherein at least two different fluent materials are simultaneously molded and united to a preform to form a composite article.

261 Uniting spaced preforms, by introducing fluent material therebetween:

This subclass is indented under subclass 259. Processes in which two distinct preformed bodies with opposing surfaces are positioned in a spaced relationship with each other and a fluent molding material at least partially fills the space between the preforms said molding material acting to unite the preforms and being contained at least in part by said preform surfaces.

(1) Note. The fluent material here is introduced primarily for the purpose of filling or partially filling the space between the preforms, with any material which extends beyond the space between the preforms being of insufficient quantity to cover or embed the preforms except, at most, in the areas immediately adjacent the space between the preforms.

SEE OR SEARCH THIS CLASS, SUBCLASS:

277, for processes wherein plural spaced bodies are embedded in or surrounded by shaping material in which the shaping material, while it may function to unite the plural shaped bodies, does more than merely fill the spaces therebetween, but also gives the final

article its outer shape or structure, at least in part.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, appropriate subclasses for processes laminating by placing adhesive between preforms and then uniting.

262 Concentric preforms:
This subclass is indented under subclass 261. Processes in which the bodies have a common center.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 294 for uniting a core within a tube where the elements are not maintained in a spaced relationship.

263 To unite independent contacting preforms:
This subclass is indented under subclass 259. Processes in which the shaping of material is on or about at least two contacting preforms, said shaped material functioning also to unite said preforms.

(1) Note. Patents will be placed herein even though a) a temporary uniting means for the preforms is disclosed to be present during the shaping or molding of the material or b) a permanent mechanical joining of the preforms is disclosed to be present.

264 Preventing adherence of shaped material to preform:
This subclass is indented under subclass 259. Processes in which at least part of the surface of the body is treated or covered to prevent the adherence of the subsequently applied material.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 290+ for bonding of facing continuously contacting laminae at spaced points only.

265 Conditioning or treatment of preform:
This subclass is indented under subclass 259. Processes in which the preformed body is acted upon in a step separate and distinct from the shaping or forming step to (1) perfect the shaping operation or (2) assist in the uniting of the body and the shaping material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
134+, for coating or impregnating a preformed body before a composite molding operation.
228, and 229, for applying a stress to a body before compositing.

266 Simultaneously shaping material and reshaping preform:
This subclass is indented under subclass 259. Processes in which a preformed self-sustaining body undergoes a reshaping simultaneously with the shaping of a material and the uniting thereof to the reshaped preform.

(1) Note. To be included herein the self-sustaining body must remain substantially self-sustaining during the reshaping operation.

SEE OR SEARCH CLASS:
29, Metal Working, appropriate subclasses for processes in which the preform is a metal.
164, Metal Founding, subclass 106 for metal compositing operation wherein the cast metal reshapes a preform.

267 Against inner surface of hollow preform :
This subclass is indented under subclass 259. Processes in which shaping material is molded against and united to at least a portion of the inner surface of an aperture, cavity or hollow contained in a preform.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 293 for inserting of a lamina in a recess and adhesion to side walls thereof.
427, Coating Processes, subclasses 230+ for processes of coating the interior of a hollow article.

268 Cap or cup-like preform (e.g., container closure, etc.):

This subclass is indented under subclass 267. Processes in which the hollow body is relatively thin walled, the end and side walls of said body form a cap or cup-like shape.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 69 for the application of end closures to containers, and subclass 62 for closure cap lining by cutting and laminating.

269 Cavity lining type:

This subclass is indented under subclass 267. Processes in which the molding material is shaped and applied so as to constitute a lining or covering layer for substantially the entire inner surface of the cavity or aperture of said hollow body.

270 Utilizing centrifugal force (e.g., pipe lining, etc.):

This subclass is indented under subclass 269. Processes which includes the use of centrifugal force to aid in the application of the lining.

(1) Note. Many of the patents classified herein pertain to pipe lining.

SEE OR SEARCH THIS CLASS, SUBCLASS:

101, for the use of centrifugal force in the formation of particulate material.

114, for the use of centrifugal force in the uniting of bulk assembled particles.

311, for the use of centrifugal force in the mold shaping of plastic material.

SEE OR SEARCH CLASS:

164, Metal Founding, subclasses 114+ for processes of centrifugal metal casting and subclasses 286+ for corresponding apparatus particularly subclass 288 for means to hold or position preformed product.

271.1 Preform embedded in or surrounded by shaped material:

This subclass is indented under subclass 259. Processes in which the preformed self-sustaining body has molding material shaped about it so that said body is surrounded by or embedded in said molding material.

(1) Note. Shaping of a molding material to a planar surface only if a preform is not within the scope of this subclass. To be placed herein, the patent must include confining the preform in two dimensions thereof with the shaping material so as to embed or surround the preform.

SEE OR SEARCH THIS CLASS, SUBCLASS:

35, for processes of forming structural installations in situ in which molding material is shaped around and united to a core or preform.

272.11 Electrical component encapsulating:

This subclass is indented under subclass 271.1. Processes in which the surrounded or embedded body, or at least a part thereof, is intended for use as component of an electrical circuit.

(1) Note. To be included here the component must be one which controls the electricity, for example, a coil, condenser, or rectifier, and not merely a conductor insulator or outlet, etc. Processing of covering conductors, etc., are classified according to the manipulative step employed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

104, for processes of producing electrical article by shaping conductive materials.

171.1+, for extrusion of plastic material around strandlike or filamentlike preforms which may be electrical conductors.

614+, for other processes of producing electrical articles which include a step of firing shaped articles or preforms.

SEE OR SEARCH CLASS:

29, Metal Working, particularly subclass 841 for encapsulation following the assembly of an electrical device to an insulative base and subclasses 855+ for encapsulation combined with assembly of a terminal or elongated conductor directly to an electrical component.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 51 for covering of indefinite-length conductors with nonpreformed material. See the search notes to subclass 47 under (12) Note, Coating, Covering and Sheathing.

174, Electricity: Conductors and Insulators, subclass 521 for embedded electrical components.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 100, 433, 434, and 787-796 for encapsulated active solid-state electronic devices.

310, Electrical Generator or Motor Structure, subclass 43 for embedded electrical generator or motor structure.

336, Inductor Devices, subclasses 96 and 205 for embedded inductor devices.

338, Electrical Resistors, subclasses 226+ for embedded electrical resistors.

361, Electricity: Electrical Systems and Devices, subclasses 600+ for encapsulated plural electrical components.

438, Semiconductor Device Manufacturing: Process, particularly subclasses 112, 124, and 127 for methods of encapsulating semiconductor devices; see the search notes thereunder.

272.12 Nonresinous encapsulant:

This subclass is indented under subclass 272.11. Processes in which the material surrounding or embedding the electrical component is not a synthetic resin.

272.13 With curing procedure, or procedure or treatment to compensate for differential expansion:

This subclass is indented under subclass 272.11. Processes in which there is claimed a step of curing the encapsulating material or some expedient is employed to compensate for the differing coefficients of expansion of an electrical component or part thereof and the encapsulant.

272.14 Plural electrical components:

This subclass is indented under subclass 272.11. Processes in which two or more electrical components are encapsulated.

272.15 With component positioning procedure or incorporation of article positioning means:

This subclass is indented under subclass 272.11. Processes in which the electrical component is claimed as positioned in a specified relation to the encapsulant or in which a positioning means is incorporated in the encapsulant.

272.16 Transducer, or electric lamp or space discharge device:

This subclass is indented under subclass 272.11. Processes in which the component encapsulated is adapted to convert mechanical to electrical energy by electromagnetism or the component is an electric lamp or electric space discharge device.

(1) Note. Electric space discharge devices are defined for the purpose of classification as including any device which is intended to have an electric current flow between two spaced electrodes, at least part of the path followed by the discharge being constituted by a gas, vapor, or vacuum. Electric space discharge devices, therefore, include spark gaps, spark plugs, radio tubes, X-ray tubes, cathode-ray tubes, gas or vapor discharge lamps and lighting arresters of the electric space discharge type.

272.17 Semiconductor or barrier layer device (e.g., integrator circuit, transistor, etc.):

This subclass is indented under subclass 272.11. Processes in which the component exhibits asymmetrical voltage current conduction characteristics.

SEE OR SEARCH CLASS:

438, Semiconductor Device Manufacturing: Process, particularly subclasses 112, 124, and 127 for methods of encapsulating semiconductor devices; see the search notes thereunder.

272.18 Condenser or resistor:
This subclass is indented under subclass 272.11. Processes in which the component encapsulated is a condenser or resistor.

272.19 Dynamoelectric machine, electromagnet, transformer, inductors, or coils:
This subclass is indented under subclass 272.11. Processes in which the encapsulated component is designed to produce an electromagnetic field or is a coil.

272.2 Motor or part encapsulated:
This subclass is indented under subclass 272.19. Processes in which the component is an electric motor or an electrical component thereof.

272.21 Battery or part encapsulated:
This subclass is indented under subclass 272.11. Processes in which the electrical component encapsulated is a source of electrical current or part of such device.

273 Shaped material extends through holes in preform:
This subclass is indented under subclass 271. Processes in which a material is shaped against a body having holes or apertures extending therethrough said material being forced into said holes or apertures during the shaping operation.

274 Preform particularly provided with means to provide interlock with shaped material:
This subclass is indented under subclass 271. Processes in which the body is provided with an undercut or other indentations to produce at least mechanical interference or keyed fit with the subsequently applied material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
249, for processes of mechanically securing preforms together by reshaping at joint portion.

275 Positioning or maintaining position of preform relative to mold surface:
This subclass is indented under subclass 271. Processes which include a provision for locating a preformed body in a specific position in a mold or maintaining such a position.

SEE OR SEARCH THIS CLASS, SUBCLASS:
247, for processes of positioning a preform in a mold and molding a different color material against the preform.
254, for positioning by holding the body against a shaping surface while molding, then molding against the body while positioning by holding the previously shaped materials.

SEE OR SEARCH CLASS:
164, Metal Founding, subclass 112 for processes of positioning a preform in metal compositing processes.

276 Preventing flash:
This subclass is indented under subclass 275. Processes in which a parting line fin or flash excess plastic material is prevented from forming or reduced by the particular positioning of the body in the mold.

277 Maintaining preforms in spaced relationship:
This subclass is indented under subclass 275. Processes in which a plurality of bodies spaced from each other during a molding operation are embedded in or surrounded by said shaping material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
261, for processes in which molding material is introduced only in the space between plural preform surfaces with no more than a slight excess or overflow, said molding material being contained at least in part by the preform surfaces and serving to unite said preforms.

278 By removable means:
This subclass is indented under subclass 275. Processes which include the utilization of positioning means which may be withdrawn from the mold before separation of the composite article from the mold or removed from the composite body subsequent to separation thereof from the mold.

279 Applying fluent material to preform:
This subclass is indented under subclass 271. Processes wherein the material which is to be shaped so as to embed or surround a preformed body is in a flowable state when applied to said preform body.

279.1 Preform is completely surrounded by shaped material:
This subclass is indented under subclass 271.1. Processes in which the preform is completely covered by the shaping material on all sides.

280 Reshaping running or indefinite-length work:
This subclass is indented under subclass 239. Processes in which the work that is mechanically shaped or molded by a physically applied force to deform, is a preform and of running or indefinite length.

SEE OR SEARCH THIS CLASS, SUBCLASS:
165+, for formation of indefinite length articles combined with subsequent treatments especially subclass 210 with stretching or deforming.
347, for curing of indefinite length materials out of a mold.

SEE OR SEARCH CLASS:
162, Paper Making and Fiber Liberation, subclass 117 for die reshaping of a waterlaid web or sheet.

281 Longitudinally advanced coiling (nonplanar):
This subclass is indented under subclass 280. Processes directed to production of helically coiled articles wherein each convolution of said coil is axially displaced from adjoining convolutions.

(1) Note. Patents reciting winding in place with no axial displacement or wherein each convolution is entirely superimposed over the preceding one are excluded from this subclass.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 169+ and 184+ particularly subclass 195, for winding combined with laminating or uniting.

282 Creping or crinkling:
This subclass is indented under subclass 280. Processes wherein the reshaping takes the form of creping or crinkling.

(1) Note. Including in this subclass are, for example, crowding the work back on itself to induce it to wrinkle, and crushing the work to produce random permanent distortions.

(2) Note. This subclass does not include corrugating, per se, within its scope. See search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
168, for indefinite length forming and crimping.
284, for corrugating, per se, of an indefinite or running length web.

SEE OR SEARCH CLASS:
26, Textiles: Cloth Finishing, subclass 18.6 for compressive shrinking.
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 183 for creping, wrinkling or crinkling combined with a laminating step.
162, Paper Making and Fiber Liberation, subclasses 111+ for processes of creping or crinkling a waterlaid web or sheet.

283 By doctoring from drum
This subclass is indented under subclass 282. Processes wherein the creping, crinkling or wrinkling is effected by means of a doctoring implement applied to a drum carrying the web wherein said web is reshaped accordingly and removed from the drum.

284 Deforming the surface only:
This subclass is indented under subclass 280. Processes which the surface configuration only of the workpiece is altered by raising bosses or protuberances thereon or causing surface portions to be depressed below the plane of the workpiece surface.

(1) Note. Where a surface only is altered by a cutting, scribing or plowing only, and no material is removed or separated therefrom through these operations, the patent will be placed herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:
138+, for processes involving a severing or material removal operation.
293, for processes including an embossing step on nonrunning length material.

SEE OR SEARCH CLASS:
101, Printing, subclass 32 for embossing processes there provided for.
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 209 and 219+ for embossing combined with a laminating step.
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 319+ for shaping apparatus comprising the combination of means to form a preform and means to convolute or twist the preform, subclasses 323+ for pretzel bending apparatus and subclass 383 for a molding apparatus including means to reshape a preform.

285 Bending:
This subclass is indented under subclass 280. Processes in which a portion of a workpiece is moved and permanently distorted throughout its entire thickness relative to a second portion during which the thickness of the workpiece remains substantially the same and no significant plastic flow occurs.

SEE OR SEARCH THIS CLASS, SUBCLASS:
339, for bending or twisting articles or workpieces.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 196+ for bending when combined with a laminating step.

286 Corrugating:
This subclass is indented under subclass 285. Processes in which the bending involves forming a web with a cross-section having alternate ridges and grooves.

SEE OR SEARCH THIS CLASS, SUBCLASS:
339, for bending or twisting of definite length articles.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 202+ and 205+ for corrugating of indefinite length work combined with a laminating operation and 210 for corrugating and laminating to a noncorrugated lamina.

287 And subsequent reshaping of corrugated material:
This subclass is indented under subclass 286. Processes wherein a reshaping step is performed on sheet material which has been corrugated.

SEE OR SEARCH THIS CLASS, SUBCLASS:
294+, for plural sequential shaping or molding steps.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 207 for deformation of corrugated laminae and or laminates.

288.4 Stretching by applying tension:
This subclass is indented under subclass 280. Process in which the reshaping is performed by pulling an end or edge of the workpiece and the workpiece is elongated in the direction of the tension application.

(1) Note. Tension applied merely to hold the work extended or taut is not consid-

ered to be within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

210.1+, for stretching combined with extrusion.

291+, for stretching or stretch forming, per se, applied to other than running or indefinite-length work.

500+, for processs where reshaping uses fluid pressure, e.g., blowing, etc.

555+, for reshaping running length work by such a procedure.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 229 for stretching combined with a laminating step.

427, Coating Processes, subclasses 172+ for a process of coating running or indefinite-length work combined with stretching or tensioning.

288.8 Nonuniform product (e.g., porous, etc., or with tensioning before application of heat):

This subclass is indented under subclass 288.4. Process including a step of applying tension to a workpiece before the workpiece is heated, e.g., "prestretching", etc., or wherein the process results in an article or running length differing from a uniform and uniform-appearing fiber, tow, or film in a specified way, whether the variation be desired or undesired, e.g., knots, color variations, etc.

(1) Note. The process may produce the variations or may tend to minimize variations in the original workpiece.

(2) Note. The tensioning may or may not result in a change of shape (cold-stretching).

SEE OR SEARCH THIS CLASS, SUBCLASS:

41+, for a process which includes pore-forming in situ.

103, for a process which includes formation of a textile fabric.

154, for a process where stretching itself causes pores to be formed.

287, for a process in which a film is corrugated and the corrugations are minimized or eliminated by later stretching.

289.3 With treatment other than heating before stretching:

This subclass is indented under subclass 288.4. Process wherein the workpiece is treated by other than heat before tension for stretching is applied, e.g., pressure treatment, fluid treatment, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

78, for a process which includes dyeing of the workpiece.

82+, for a process which includes reactive gas or vapor treatment of the workpiece.

103, for a process which includes textile fabric formation.

138+, for a process in which a portion of the workpiece is modified to aid the stretching procedure and the modified portion is later removed from the stretched workpiece.

289.6 With shrinking or with liquid contact during or after stretching:

This subclass is indented under subclass 288.4. Process wherein a liquid material, e.g., a sizing or heat exchange material, etc., makes direct contact with the workpiece during the stretching operation or after the stretching operation, or wherein the process includes a step in which stretching tension is reduced, allowing a dimension of the workpiece to decrease.

SEE OR SEARCH THIS CLASS, SUBCLASS:

78, for a process wherein a workpiece is dyed.

129+, for a process wherein the workpiece is coated, outside the mold, that is, when not under stretching conditions.

289.3, for a process in which liquid contact or shrinking takes place before any stretching.

SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, subclasses 375+ and 411+ for coated, e.g., lubricated, etc., fibers and sheets, respectively, per se.

290.2 Biaxial or transverse to travel direction:
This subclass is indented under subclass 288.4. Process wherein a moving workpiece is stretched in a direction at right angles to its direction of movement or in which a stationary, indefinite-length work-piece is stretched in two perpendicular directions.

SEE OR SEARCH THIS CLASS, SUBCLASS:
138+, for a process wherein stretching is followed by removal of part of the workpiece.
235.8, for a process wherein biaxial stretching of a film is followed by heat-setting. When all of the claims of a patent include the heat setting step, the patent is preferably not cross-referenced to this subclass.

290.5 Of filament:
This subclass is indented under subclass 288.4. Process wherein the workpiece is one having a width and thickness of small and about equal dimensions.

(1) Note. The filament may be a monofilament or a tow or yarn, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
289.6, for filament stretching where a shrinking is included in the process.

290.7 Including contact with mechanism in stretch path (e.g., snubbing, etc.):
This subclass is indented under subclass 290.5. Process wherein the fiber, besides contact with the two essential mechanisms which cause the tension application and define the stretch path, contacts also a third solid object arranged between the two essential mechanisms.

(1) Note. The third object often, but not always, serves the purpose of defining the necking point of the fiber during stretching.

291 Stretching or stretch forming:
This subclass is indented under subclass 239. Processes wherein external tension is applied to a self-sustaining body so as to effectively increase at least one surface dimension thereof or otherwise reshape the body by extending it beyond the elastic limit.

(1) Note. Incidental stretching which occurs in the normal reshaping of a workpiece between dies is not considered sufficient to place a patent in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
2, for processes of forming polarizing sheets by a stretching step.
88+, for tensional deformation of self-sustaining bodies generated by direct application of fluid pressure or vacuum to work or molding material.
288, for stretching of running length work.

SEE OR SEARCH CLASS:
427, Coating Processes, subclasses 171+ for processes of coating combined with stretching or tensioning.

292 By drawing over a form:
This subclass is indented under subclass 291. Processes wherein the workpiece is forced to assume the shape of a form by said stretching of the workpiece over the form and into contact therewith.

SEE OR SEARCH THIS CLASS, SUBCLASS:
90+, for stretch forming with vacuum.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 212 for bending, drawing or stretching forming of a sheet to assume shape of a configured lamina while in contact therewith.

293 Deforming the surface only:
This subclass is indented under subclass 239. Processes in which the surface configuration only of the workpiece is altered by raising bosses or protuberances thereon or causing sur-

face portions to be depressed below the plane of the workpiece surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

106+, for embossing a preform to provide surface sound grooves.

138+, for processes including a cutting operation.

284, for embossing of a running or indefinite length work and see the notes thereto.

SEE OR SEARCH CLASS:

101, Printing, subclasses 3.1+ for embossing processes there provided for.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 209 and 219+ for surface deformation or embossing combined with a laminating operation.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 385 for a preform reshaping means comprising a surface deformation means only.

294 Plural sequential shaping or molding steps on same workpiece:

This subclass is indented under subclass 239. Processes which include plural molding or shaping steps said steps being distinct, separate and sequential.

(1) Note. Included herein are processes in which a similar type of molding, which may differ in magnitude or direction is applied in plural steps to the same portion of the article.

(2) Note. See appropriate subclasses in this class and the search notes below in particular for processes which involve incremental molding or accretion from bulk, e.g., successive dip casting, and those operations which involve repetition to give an overall unitary effect, e.g., sequential corrugation, stepwise elongation of successive portions of an article or bending a sheet in steps to form a U-shape.

(3) Note. Where a patent may recite a preliminary "extrusion" prior to a molding operation where said "extrusion" is disclosed to be for the purpose of mixing, agitating or controlling or directing a stream of liquid or plastic material enroute to the molding means, rather than for shaping by extrusion, said "extrusion" will not be considered a diverse molding step for purpose of this subclass but will be classified on some other basis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

88+, for plural forming steps wherein one Is by a fluid pressure differential.

285+, for processes of bending or corrugating indefinite length work.

301+, particularly subclass 305 for processes involving accretion from bulk.

308, for processes which include incremental molding.

339, for bending or twisting of work.

295 Molding followed by bending or twisting:

This subclass is indented under subclass 294. Processes wherein the plural steps comprise at least one molding step followed by at least one bending or twisting operation in which (a) a portion of a workpiece is moved throughout its entire thickness relative to a second portion during which the thickness of the workpiece remains substantially the same and no significant plastic flow occurs or (b) there is distortion of a single solid body by relative movement of its parts about a common axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

98+, for a pneumatic shaping pressure applied to the inside of a hollow work following preliminary extrusion of a blank or blank portion.

103, for twisting of plural elements about each other.

339, for distortion by twisting, per se.

296 One step reshapes portion only of article:

This subclass is indented under subclass 294. Processes in which at least one of the shaping or molding steps alters the existing configuration of a limited portion of the article.

297.1 Forming plural articles:
This subclass is indented under subclass 239. Processes which include forming a plurality of separate and distinct articles either simultaneously or sequentially.

(1) Note. To be placed in this subclass, the articles formed must not be particulate in nature, that is, of such a size that the formed particles can be handled in bulk only. For formation of particulate material from a liquid or molten mass, see the search note below.

(2) Note. The fact that the apparatus used in the process may be capable of continuous operation thus forming plural articles, for example, injection molding devices, is not sufficient to place a patent in this and the indented subclasses. To be placed in this array the patent must claim the process of forming plural articles.

SEE OR SEARCH THIS CLASS, SUBCLASS:
5+, for formation of particulate material directly from a molten or liquid mass.
157+, where plural articles are produced by cutting operations.

SEE OR SEARCH CLASS:
249, Static Molds, subclasses 119+ for molds for forming plural products.

297.2 Including introducing material under pressure into a closed mold cavity (e.g., injection molding, etc.):
This subclass is indented under subclass 297.1. Processes which include a step of forcing material from a source removed from a closed mold cavity into the cavity wherein said material assumes the shape of the closed mold cavity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
328.1+, for processes of injection molding of single articles or multiple attached articles.

297.3 With plural molds on belt or turntable:
This subclass is indented under subclass 297.2. Processes in which the molds into which material is forced under pressure are mounted on a continuous surface or are mounted to provide for rotary motion of the molds about a central axis.

297.4 Forming multiple stacked or nested articles or including multilayer pressing:
This subclass is indented under subclass 297.1. Processes in which a plurality of articles are shaped by performing a forming operation on a stack or nest of preforms or in which a single press couple acts on a stack of shaping members.

(1) Note. This subclass includes a process of forming a chain or article articulated in a chainlike manner as a nested article.

(2) Note. This subclass also includes the use of parting material in a stack of preforms to be shaped.

297.5 Reshaping or treatment of a preform (e.g., vulcanizing, etc.):
This subclass is indented under subclass 297.1. Processes in which a preform is reshaped or subjected to chemical or physical treatment after shaping.

(1) Note. The reshaping processes provided for herein typically reshape part of a preform such as belling the end of a length of pipe or vulcanize a group of preforms.

SEE OR SEARCH THIS CLASS, SUBCLASS:
294+, for plural sequential shaping steps preformed on a workpiece.

297.6 With plural molds on a moving surface:
This subclass is indented under subclass 297.1. Processes which include the use of a series of molds mounted on a moving surface providing linear or rotary motion to the molds.

297.7 With linear movement of the molds:
This subclass is indented under subclass 297.6. Processes in which the moving surface carries the molds in a straight line.

(1) Note. This subclass provides for molds mounted on belts. Subclass 297.6 will provide for molds carried by a turntable.

297.8 Simultaneous formation of plural articles:
This subclass is indented under subclass 297.1. Processes in which a plurality of separate and distinct articles are formed at the same time.

297.9 Of primarily inorganic material (e.g., concrete or ceramic, etc.):
This subclass is indented under subclass 297.8. Processes in which the articles are composed of inorganic material.

(1) Note. This subclass provides for processes of making dishes and concrete panels.

298 By casting on a liquid surface:
This subclass is indented under subclass 239. Processes in which the article forming material is shaped by casting or depositing the material on a liquid body the surface of which acts as the shaping means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
88, for direct application of fluid pressure to a workpiece or molding material.
165+, for formation of continuous or indefinite length articles by casting on a liquid surface.
212+, for formation of continuous or indefinite length articles by casting on a solid supporting or shaping surface.

SEE OR SEARCH CLASS:
164, Metal Founding, subclass 81 for processes of metal casting on a liquid shaping surface.

299 Shaping against forming surface (e.g., casting, die shaping, etc.):
This subclass is indented under subclass 239. Processes in which (1) fluent or plastic material is caused to flow to assume the configuration of a solid shaping surface in contact therewith, or (2) solid material is forced against a shaping surface by pressure means opposed thereto.

(1) Note. Vulcanizing between pressure surfaces or in a shape retaining cavity is considered to involved "mold shaping" for the purpose of this subclass and those indented hereunder.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, appropriate subclasses for processes and apparatus for shaping glass.
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, appropriate subclasses for corresponding apparatus, see especially subclasses 376.1+ for an extrusion shaping apparatus, subclasses 383+ for molding apparatus for reshaping a preform, subclasses 406+ for a press molding machine, and subclasses 425+ for a molding machine utilizing mold motion to shape or to compact.

300 Utilizing release agent in molding material:
This subclass is indented under subclass 299. Processes in which parting or release material is incorporated in the molding composition to facilitate subsequent removal of the formed article from the mold or shaping surface.

301 Accretion from bulk:
This subclass is indented under subclass 299. Processes in which the molding material is applied in bulk to the molding surface causing a relatively small proportion to be deposited or adhered to the molding surface followed by relatively separating the mold form with the adhering material from the remaining bulk.

(1) Note. This subclass includes, for example, pouring molding material into a mold and pouring out the excess which does not cling to the mold walls or dipping a mold form into the molding material and removal of said form therefrom with a coating of said material adhered to the molding surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
215, for processes of forming indefinite length or continuous articles wherein the molding surface, e.g., belt or wheel, dips into the molding material.
308, for incremental molding processes.

SEE OR SEARCH CLASS:

162, Paper Making and Fiber Liberation, subclasses 228+ for processes of accreting from a bulk supply of pulp suspension.

427, Coating Processes, subclasses 430.1+ for processes of coating by immersion and see the class definition of Class 264 at section II F for the line between Classes 264 and 427.

302 Slush casting type:

This subclass is indented under subclass 301. Processes wherein the molding material is poured or placed in the mold and the excess material not deposited, gelled or coagulated on the mold surface is removed to leave a relatively thin deposit or layer on the inner walls of the mold.

SEE OR SEARCH THIS CLASS, SUBCLASS:

310, for processes wherein a material is rotationally cast without excess material removal.

SEE OR SEARCH CLASS:

164, Metal Founding, subclass 77 for processes of slush casting of metals.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 433 for slush molding in molds peripherally supported on an endless belt and subclass 435 for other slush molding apparatus.

303 Accretion of varying wall thickness or control of accretion by compound movement of form:

This subclass is indented under subclass 301. Processes in which the deposition or accretion on the mold surface is of a nonuniform or varying thickness to produce articles which have an irregular or nonuniform cross-sectional wall thickness, or in which the accretion rate or overall thickness of the accretion is controlled or regulated by a compound or nonlinear movement of the molding form or surface.

304 Facilitating removal of article from form:

This subclass is indented under subclass 301. Processes which include a step which facilitates removal of the formed article from the mold or forming surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

334+, for casting ejecting, core or mold stripping or separating.

305 Successive dipping steps into same material:

This subclass is indented under subclass 301. Processes wherein the accretion of the material is in plural separate stages by separate dippings into a source or supply of the same molding material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

215, for processes of forming indefinite length or continuous articles wherein the shaping surface, e.g., endless belt or wheel is dipped into the molding material.

SEE OR SEARCH CLASS:

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 269+ for corresponding apparatus.

427, Coating Processes, subclasses 430.1+ for processes of coating by immersion, and see Class 264 class definition at section II F.

306 Conditioning or treating material or form to effect deposition:

This subclass is indented under subclass 301. Processes in which the deposition or accretion of the molding material on the mold is facilitated or effected by a separate treatment or conditioning of the material or the mold surface.

SEE OR SEARCH CLASS:

204, Chemistry: Electrical and Wave Energy, subclasses 471+ for electrophoretic or electro-osmotic coating or forming of an object.

427, Coating Processes, subclasses 133+ for processes of coating a mold.

307 Treating accreted material on form with added agent or reactant:
This subclass is indented under subclass 301. Processes wherein the accreted or deposited material is subsequently treated while still on the form with an added agent or reactant.

SEE OR SEARCH THIS CLASS, SUBCLASS:
195, for subsequent chemical treatment of indefinite length viscose articles.
218, for processes including a subsequent treatment of a cast carbohydrate containing layer with a reactant or coagulating agent.
232, for processes which include a subsequent disparate treatment of an article out of the mold.
340+, for treatment, per se, of shaped articles.

308 Incremental layer molding type:
This subclass is indented under subclass 299. Processes in which the same material is applied in multiple, sequential charges in or on the same mold or molding surface, or on the surface of a previously deposited or formed layer of the same material, the formed article resulting therefrom being homogeneous and unitary in structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
171.1+, for stratified or layered indefinite length article forming.
241+, for forming composite, plural part or multilayered articles.

309 Spraying or flinging material against a shaping surface:
This subclass is indented under subclass 299. Processes in which the molding material is propelled forcibly through space in either compacted bulk form, or discrete form, to thereby impinge against and collect in or on a molding or shaping surface or means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
30, for processes of lining a furnace by spraying or flinging material against a surface.
91, for vacuum depositing bulk particles.
98+, for formation of solid particulate material directly from a molten or liquid mass which may involve forcible impingement of a liquid on a surface.
109+, for formation of articles by adhesive uniting of particulate nonmetallic material.

310 By rotation of material or material shaping member:
This subclass is indented under subclass 299. Processes in which rotating motion is imparted to the material being shaped or to the mold or mold shaping surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
68, for rotation to produce frictional heat.
69+, for processes which pertain to agitating by plural sequential rotations in reverse directions. However, such patents should be crosses herein where applicable depending on the time of duration of said rotation periods in one direction.
175, for processes of forming indefinite length articles by a calendering operation between endless shaping surfaces, e.g., belts or wheels.

311 Utilizing centrifugal force:
This subclass is indented under subclass 310. Processes which include the generation of a centrifugal force which is applied to the molding material, the effect of said centrifugal force being manifested in the shaping, distribution or maintenance of said molding material in the mold.

SEE OR SEARCH THIS CLASS, SUBCLASS:
8, for formation of particulate material from a liquid or molten mass by means of centrifugal force.
114, for use of centrifugal force in formation of articles by uniting of bulk assembled particles.
176, for centrifugal spinning of filaments or fibers.
270, for processes of lining a mold cavity employing centrifugal force.

SEE OR SEARCH CLASS:

164, Metal Founding, subclasses 114+ for processes of centrifugally casting metals.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 425 for a molding machine utilizing mold motion to distribute or compact a fluent material in a mold.

312 Inner relatively rotating member to form hollow article:

This subclass is indented under subclass 310. Processes in which a recess is formed, enlarged or maintained by a correspondingly shaped means for such recess which means performs such function by a rotation relative to the body containing such recess.

313 Utilizing a flexible, deformable, or destructable molding surface or material:

This subclass is indented under subclass 299. Processes in which the mold or mold surface is flexible, resilient, deformable or may be collapsed or destroyed to facilitate removal or separation of the molded article from the mold.

SEE OR SEARCH THIS CLASS, SUBCLASS:

219+, where the flexible or deformable mold surface is anatomical.

318, for processes for making undercut articles in rigid molds.

334+, for processes directed to casting, ejecting, core or mold stripping, or separating of articles from molds or shaping devices and see the search notes thereto.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 423+ for processes employing transitory or temporary material or parts.

314 Utilizing fluid-expansible mold:

This subclass is indented under subclass 313. Processes in which the mold pressure is applied through fluid inflatable or expansible means.

315 Toroidal mold bag:

This subclass is indented under subclass 314. Processes in which said inflatable element is toroidal in shape.

(1) Note. A toroidal shape is that generated by a closed planar figure when rotated about an axis lying in the same plane therewith and outside the figure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

326, for reshaping toroidal shaped work in a closed mold cavity.

316 Utilizing sheet-like material:

This subclass is indented under subclass 313. Processes wherein a flexible or resilient sheet or web is employed as a mold or mold surface or as a separate mold liner.

(1) Note. Tubes or casings or other hollow articles regardless of length are not considered to be sheets or webs for purposes of this subclass and are excluded herefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

338, for mold coatings or linings, per se, or specific materials.

317 Removing mold by destruction:

This subclass is indented under subclass 313. Processes in which the mold or mold surface is destroyed to facilitate removal thereof from the molded material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41+, particularly subclasses 44 and 49 for destruction of entrained bodies to form a porous body.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 155 for destruction of transitory material when combined with a laminating operation.

318 Molding trapped undercut article portion:

This subclass is indented under subclass 299. Processes directed to the molding of articles of such irregular shape in rigid molds that portions of said articles and corresponding portions of the mold are in the relationship of an interference fit in that removal of said article

from the mold cannot be accomplished be a straight line or unidirectional motion, except where the trapped portions of the article are at least temporarily flexible, elastic or resilient so as not to be broken or deformed from the desired shape by the confining portions of the mold if a straight line removal from the mold is employed.

(1) Note. This subclass will not take patents reciting the molding of articles which may have trapped undercut surfaces in the mold but which by specific mold structure may be removed therefrom in a straightline or unidirectional motion. However, this subclass will take processes of forming articles of curved shapes in a rigid mold from which the shaped articles may be withdrawn without interference from the mold by a nonlinear motion corresponding to the curvature of said article such as the formation of threaded articles removed by an "unscrewing" operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

313+, for processes employing a flexible, deformable or destructible molding surface or material.

336, for processes of ejecting, stripping or separating formed articles from the mold before a full set or cure has taken place.

319 Applying heat or pressure:

This subclass is indented under subclass 299. Processes in which the material, while being shaped (1) is raised in temperature or (2) is subjected to an increase in pressure.

320 Reshaping solid work or introducing solid work into mold cavity:

This subclass is indented under subclass 319. Processes in which the material shaped is (1) a self-sustaining preform throughout the reshaping operation or (2) is a self-sustaining preform when placed into a mold.

(1) Note. Solid particulate molding material which is handled or charged to the mold as a fluent mass is not included within the scope of this and indented subclasses, however, solid particles or pieces which are placed, handled, or charged individually are considered self-sustaining preforms or bodies for purposes of this and indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

107, for reshaping a solid preform to form sound grooves on its surface.

112, for spheroidizing or rounding of particles in absence of a mold or shaping surface.

230, for reshaping of a solid preform by heating to release stress, e.g., elastic memory.

321 Sponge-like or foamed work:

This subclass is indented under subclass 320. Processes wherein said work is of a sponge-like or foamed structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41+, for molding or shaping combined with the step of pore forming in situ.

324, for processes for shaping a woven or felted sheet.

322 Initially softening workpiece:

This subclass is indented under subclass 320. Processes in which the solid workpiece is subjected to a treatment prior to reshaping for the purpose of decreasing its rigidity or hardness.

(1) Note. The treatment may be, for example, heating, moistening, or solvent application.

(2) Note. Preliminary softening of the workpiece by liquid impregnation within the scope of this subclass differs from coating or impregnating the workpiece before molding or shaping as provided for by subclasses 134+ in that the impregnation in the present subclass is transitory and that of subclasses 134+ in a permanent component of the article formed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

340, for treatments, per se, of preformed articles which are directed to or included softening operations.

323 Sliding motion between material and mold surface (extruding finite articles)

This subclass is indented under subclass 320. Processes in which the reshaping of a solid preform is effected by establishing a rubbing, wiping or sliding action between the preform and a shaping surface.

(1) Note. Included within the scope of the subclass is pressing a preform between mold surfaces and causing the preformed material to be reshaped and spread along the mold surfaces into an unconfined area. When such an operation is caused by striking the preform with a shaping element causing the material to be extruded out between the shaping surfaces the process is usually referred to as impact extrusion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

165+, for formation of continuous or indefinite length articles by extrusion methods.

325, for processes of reshaping a preform in a closed mold cavity.

324 Woven or felted sheet-form work:

This subclass is indented under subclass 320. Processes in which the work being shaped is a felted fibrous sheet or a woven textile sheet.

SEE OR SEARCH THIS CLASS, SUBCLASS:

136+, for coating or impregnating a self sustaining batt, sheet of filament and then reshaping.

257+, for producing a composite, plural part or multilayered article in which one component is a fibrous or textile sheet, web or batt.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 62.2+ for forming and laminating one or more webs or batts by adhesive bonding and subclasses 196+ for reshaping followed by laminating.

162, Paper Making and Fiber Liberation, subclass 223 for processes of reshaping a felted waterlaid product.

325 Utilizing closed mold cavity:

This subclass is indented under subclass 320. Processes in which the solid work or molding material, within the confines of a closed mold cavity, is caused to take the shape of the interior of said mold cavity by a plastic flow of said work or molding material.

(1) Note. A mold cavity is considered closed for purposes of this subclass if it engages all of the exterior product surfaces being formed or reshaped. Spaces between mold parts or small openings in said parts will not exclude a mold cavity from this subclass even though some molding material is forced from the mold cavity through such spaces and openings.

326 Toroidal work (e.g., tire, etc.):

This subclass is indented under subclass 325. Processes wherein the article produced has a toroidal shape.

(1) Note. For a definition of “toroidal” see this class, subclass 315 and note thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:

315, where the pressure or heat is applied by means of a toroidal inflated bag.

327 Differential heating or cooling in mold:

This subclass is indented under subclass 319. Processes wherein different degrees of heating or cooling are positively applied simultaneously to the article or molding material, or different portions thereof, while said article is still in the mold.

(1) Note. To be placed herein a patent should recite a positively applied temperature differential. Normal heating or cooling to ambient temperatures, for example, wherein an article may be cooler at the surface temporarily than at the core, is not sufficient to place a patent herein.

(2) Note. Maintaining a uniform temperature of the product by the nonuniform application or removal of product heat is classified herein.

328.1 Introducing material under pressure into a closed mold cavity (e.g., injection molding, etc.):
This subclass is indented under subclass 319. Processes in which said pressure is applied to the molding material so as to force the material from a source removed from a closed mold cavity into the cavity wherein said material assumes the shape of the interior of said closed cavity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
537, for injection molding of a hollow blank portion prior to pneumatic pressure application to the inside.

328.11 Including movement of mold relative to injector:
This subclass is indented under subclass 328.1. Processes in which relative movement of the mold and injector head is accomplished by displacement of either or both.

328.12 Including specified direction or condition of flow in mold:
This subclass is indented under subclass 328.1. Processes in which the injection mold is designed to produce a specified direction of flow or a specified type of flow of material during injection.

328.13 Including injection of two or more pressures:
This subclass is indented under subclass 328.1. Processes in which injection takes place at two distinct pressure levels.

SEE OR SEARCH THIS CLASS, SUBCLASS:
40.5, for processes of pressure control during molding.

328.14 With heating or cooling:
This subclass is indented under subclass 328.1. Processes in which a positive step of increasing or decreasing the temperature is carried out.

(1) Note. This subclass does not include merely cooling by exposure to ambient conditions but does include frictional heating.

SEE OR SEARCH THIS CLASS, SUBCLASS:
68, for processes including step of generating heat by friction.
232+, for processes of heating or cooling after molding.
345+, for article treatment by effecting a temperature change.

328.15 Of injection nozzle:
This subclass is indented under subclass 328.14. Processes in which the nozzle of the injection is heated or cooled.

328.16 Of mold:
This subclass is indented under subclass 328.14. Processes in which the mold is heated or cooled.

328.17 Pretreatment or preparation of charge material:
This subclass is indented under subclass 328.1. Processes in which the material to be molded is treated to facilitate the subsequent molding process.

328.18 Mixing of filler, dye, or pigment:
This subclass is indented under subclass 328.17. Processes in which a filler, dye, or pigment is mixed with the injector charge prior to molding.

328.19 Including feeding to accumulator:
This subclass is indented under subclass 328.17. Processes in which the fluent material to be molded is stored in a zone prior to being fed to the injector head.

328.2 Material is nonthermoplastic:
This subclass is indented under subclass 328.1. Processes in which curable, vulcanized, ceramic or hydrolitically settable or is otherwise identified as not softening upon reheating after molding.

(1) Note. In the absence of a clear showing to the contrary a material is presumed to be a thermoplastic.

328.3 Toroidal work (e.g., tire, etc.):
This subclass is indented under subclass 328.2. Processes wherein the article produced is a torus.

(1) Note. For a definition of "toroidal", see this class (264), subclass 315, and the notes thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:
315, where pressure is applied by means of a toroidal inflated bag.
501, where direct fluid pressure is used to form a toroidal article.

328.4 Utilizing a transfer chamber:
This subclass is indented under subclass 328.2. Processes in which molding material is accumulated in a pressurized zone upstream of the injector head.

328.5 With preformed charge:
This subclass is indented under subclass 328.4. Processes in which the material to be molded is a preform.

328.6 Including mixing of reactants:
This subclass is indented under subclass 328.2. Processes in which chemical reactants are mixed prior to injection or in the mold cavity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
240, for combining reactable materials during shaping.
349, for mixing of materials in general.

328.7 Including changing mold size or shape during injection or between multiple stages of injection:
This subclass is indented under subclass 328.1. Processes in which the physical conformation of the mold cavity is altered while injecting material or between stages of injecting material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
45.2, for processes of forming a multipart or composite article using an expandable mold.

328.8 With multiple injectors, mold cavities, or multiple steps of injection of material:
This subclass is indented under subclass 328.1. Processes in which multiple injectors feed a single mold cavity, or a single injector feeds a series of connected mold cavities or a single mold cavity in a series of distinct steps.

SEE OR SEARCH THIS CLASS, SUBCLASS:
250+, for processes of separately molding different portions of a single article.
328.13, for processes involving injection of a single charge of material at varying pressure.

328.9 Including operation or design to minimize formation of gate, sprue, or flash:
This subclass is indented under subclass 328.1. Processes in which the process is carried out so as to minimize or eliminate the formation of undesired waste material.

330 Organic material shaping:
This subclass is indented under subclass 319. Processes in which the material being molded is organic compound containing.

(1) Note. Attention is directed to the definitions of Class 260, Chemistry of Carbon Compounds, for the scope the term "organic compound" as employed herein.

(2) Note. See the main definitions to this class (264) for the line between this class and the composition classes.

(3) Note. Included in this and indented subclasses are generally patents which include a unique combination of a specifically recited organic material and a particular molding temperature or pressure. Numerous patents which include a specific manipulation or step provided for above will also disclose a particular composition and temperature or pressure. Such patents are cross-referenced here only when they include some evidence that the temperature or pressure are not conventionally used in molding the particular material.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, appropriate subclasses for organic compositions.

260, Chemistry of Carbon Compounds, subclasses 97+ for natural resins and reaction products thereof.

520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Classes 523 and 524 for molding compositions.

331.11 Synthetic resin containing:

This subclass is indented under subclass 330. Processes in which the organic material employed comprises a synthetic resin.

(1) Note. For the definition of "synthetic resin", see Class 520, Synthetic Resin or Natural Rubbers, subclass 1.

(2) Note. See the definitions of this class (264) for the line between this class and the composition classes.

(3) Note. Classification herein is based on the first appearing polymer or monomer including a monomer used to aftertreat a solid polymer.

SEE OR SEARCH CLASS:

260, Chemistry of Carbon Compounds, subclasses 2.01+ for synthetic resinous compositions which may be disclosed to possess utility as molding materials, and see (1) Note and (2) Note above.

520, Synthetic Resins or Natural Rubbers, particularly Classes 523 and 524 for a synthetic resin or natural rubbers composition which may be disclosed or claimed to posses utility as molding materials, and see (1) Note and (2) Note above

331.12 Polymer having heterocyclic group or polymer derived from monomer having heteocyclic group except heterocyclic derived solely from carboxylic acid (i.e., cyclic imide, lactam, lactone, or anhydride):

This subclass is indented under subclass 331.11. Processes in which the synthetic resin is a polymer having or polymer derived from a monomer having a heterocyclic group, i.e., an organic compound wherein one or more carbon atoms are covalently bonded in a ring system with at least one hetero atom of oxygen, sulfur, nitrogen, selenium, or tellurium and there are no other different atoms in the ring, except heterocyclic derived solely from carboxylic acid, i.e., cyclic imide, lactam, lactone, or anhydride.

(1) Note. See subclass 331.13 for the definition of ethylenic group.

SEE OR SEARCH THIS CLASS, SUBCLASS:

331.15+, for ethylenically unsaturated carboxylic acid derivatives, i.e., lactams, cyclic imides, lactones, or anhydrides.

331.19, for lactams or cyclic imides not containing an ethylenic group.

331.21, for lactones or anhydrides not containing an ethylenic group.

331.13 Polymer derived from monomer having at least two ethylenic groups (e.g., ABS rubber, chloroprene, etc.) or with natural rubber:

This subclass is indented under subclass 331.11. Processes wherein the synthetic resin is a polymer derived from a monomer having at least two ethylenic groups, e.g., ABS rubber, chloroprene, etc., or wherein the organic material comprises a synthetic resin with a natural rubber.

(1) Note. An ethylenic group is defined as two carbon atoms bonded together by a double or triple bond, with the proviso that the double bond is not part of an aromatic ring, or of a ring which shares a double bond with an aromatic ring.

331.14 Fluorine:

This subclass is indented under subclass 331.11. Processes in which the synthetic resin contains a fluorine atom.

331.15 Ethylenically unsaturated polymer or polymer derived from ethylenically unsaturated monomer:

This subclass is indented under subclass 331.11. Processes in which the synthetic resin is an ethylenically unsaturated polymer or a polymer derived from an ethylenically unsaturated monomer.

(1) Note. Ethylenically unsaturated requires the presence of two carbon atoms bonded together by a double or triple bond, with the proviso that the double bond is not part of an aromatic ring, or of a ring which shares of a double bond with an aromatic ring.

331.16 Nitrogen containing polymer:
This subclass is indented under subclass 331.15. Processes in which the polymer contains nitrogen.

331.17 Hydrocarbon polymer:
This subclass is indented under subclass 331.15. Processes in which the polymer is a polymer containing only carbon and hydrogen atoms.

331.18 Carboxylic acid or derivative (e.g., acrylic, etc.):
This subclass is indented under subclass 331.15. Processes in which the polymer contains a carboxylic acid or derivative group, e.g., acrylic, etc.

(1) Note. For the definition of a carboxylic acid or derivative, see Class 528, subclass 271.

331.19 Nitrogen containing (e.g., polyamide, polyurethane, etc.):
This subclass is indented under subclass 331.11. Processes in which the synthetic resin contains a nitrogen atom, e.g., polyamide, polyurethane, etc.

331.21 Carboxylic acid or derivative:
This subclass is indented under subclass 331.11. Processes in which the synthetic resin contains a carboxylic acid or derivative group.

(1) Note. For the definition of a carboxylic acid or derivative, see Class 528, subclass 271.

331.22 Polymer derived from aldehyde:
This subclass is indented under subclass 331.11. Processes in which the synthetic resin is a polymer derived from an aldehyde.

332 Fusing or melting inorganic material:
This subclass is indented under subclass 319. Processes in which inorganic materials are reshaped or molded by a fusing or melting operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
30, for processes of lining furnaces which may include a step of melting inorganic materials.
603, for vitrification, sintering, or firing of a shaped inorganic preform external of a mold.

SEE OR SEARCH CLASS:
65, Glass Manufacturing, appropriate subclasses for molding molten glass.
106, Compositions: Coating or Plastic, appropriate subclasses for processes of forming a composition which may include a firing step.

333 Inorganic hydraulic settable material shaping:
This subclass is indented under subclass 319. Processes directed to the molding and shaping of inorganic materials which are capable of being hydrolyzed by water to a solid state.

(1) Note. In cross-referencing to this subclass the same general rule should be followed as set out in the definition of subclass 330.

SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, appropriate subclasses for hydraulic settable materials and the method of producing the same.

334 Article or material ejecting, core or mold stripping or separating:
This subclass is indented under subclass 299. Processes which include the step of removing or displacing molding material or the formed article from or relative to the shaping surface.

(1) Note. This subclass includes processes of removing articles from molds, per se, when claimed in such a manner as to have utility only in a molding operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

304, for an ejecting operation in an accretion from bulk forming process.

317, where a core or mold is destroyed for removal of the article.

318, for the molding of trapped or undercut articles wherein the articles are removed from the mold by a nonlinear motion.

335 By direct fluid pressure or pressure differential:

This subclass is indented under subclass 334. Processes wherein the removal is effected or facilitated by a direct application of a fluid pressure or vacuum including a fluid blast or stream.

336 Ejecting or stripping before full set or cure of work:

This subclass is indented under subclass 334. Processes in which the article or molded material is ejected or stripped from the mold or molding surface when a desired shape is obtained but before the article is completely set or cured.

SEE OR SEARCH THIS CLASS, SUBCLASS:

82, for curing products with a reactive gas or vapor.

318, for methods of forming undercut articles in which the article is removed from the mold while the undercut portions are still flexible to permit removal without breaking.

337 Utilizing particular mold material:

This subclass is indented under subclass 299. Processes in which the shaping or forming mold or surface is composed of special or specific materials.

(1) Note. Many patents which include a manipulation or step provided for above will also include a disclosure of using a particular mold composition coating or lining. Such patents should not be cross-referenced to this and indented subclass unless there is some indication the materials recited are not those conventionally used in such processes.

338 Coating or lining:

This subclass is indented under subclass 337. Processes in which the special or specific materials are in the form of a coating or lining on the mold surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

213, where a casting surface for casting indefinite length articles is treated with a surface parting, antistick or release agent.

255+, in which a layer of material deposited on a mold surface becomes part of a composite formed article.

306, for processes which include the step of conditioning, e.g., coating, the form employed in a dip casting operation.

SEE OR SEARCH CLASS:

427, Coating Processes, subclasses 133+ for processes of coating a mold.

339 Bending or twisting of work:

This subclass is indented under subclass 239. Processes in which a portion of a single body is permanently distorted throughout its entire thickness relative to a second portion during which the thickness of the workpiece remains substantially the same and no significant plastic flow occurs or in which said body is permanently distorted by relative movement of its parts about a common axis.

(1) Note. Plural similar, bending operations are included herein. For plural diverse types of bending or shaping operations, see the search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

103, for “twisting” of plural materials about each other and subclass 295 for a molding step combined with the step of bending or twisting.

285+, for bending of running or indefinite length work.

294+, where bending or twisting of the work is one of a plurality of molding or shaping steps.

340 TREATING SHAPED OR SOLID ARTICLE:

This subclass is indented under the class definition. Processes in which preformed, shaped, or solid articles are subjected to a treatment.

(1) Note. Treatment, for the purpose of this and indented subclasses, included all procedures in which the chemical or physical properties or characteristics of a work piece are modified or controlled by other than mechanically shaping by contacting the work with a solid shaping member.

(2) Note. Subsequent treatment, per se, of an article, which involves a chemical reaction with said article, in the absence of a particular manipulative or handling step, or specific shape retaining or supporting step not otherwise classifiable above, is not sufficient to bring a patent herein. See the line between the composition classes and this class as set out in the definitions above.

(3) Note. To complete the search for processes of treating the appropriate subclasses set out above which include combinations of shaping and treating should be searched.

SEE OR SEARCH THIS CLASS, SUBCLASS:

232+, for processes including a subsequent disparate treatment.

349, for treatment of a mass by kneading, mulling, etc.

341 Solvent polishing type:

This subclass is indented under subclass 340. Processes wherein the article has its surface smoothed or leveled by application of a material having a dissolving or softening action on said article.

(1) Note. Polishing of materials by chemical action wherein contaminants or surface reaction products, e.g., rust, oxides, etc., are removed is not included in the scope of this subclass. See the definitions to Class 216, Etching a Substrate: Processes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

39, for processes which include polishing of an apparatus surface as by mechanical action or removal of surface accretions, e.g., cleaning.

SEE OR SEARCH CLASS:

216, Etching a Substrate: Processes, for removal of surface material by etching with solvent or chemical reagents to polish or form a design.

342 To shrink:

This subclass is indented under subclass 340. Processes in which a treatment serves to decrease the surface area of said material.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 116+ for processes including a shrinking operation.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 76 for shrinking of a lamina in which parchmentizing or transparentizing also occurs and subclasses 84+ for shrinking combined with a laminating step.

228, Metal Fusion Bonding, subclass 128 for bonding of metal parts by thermally shrinking one of the parts.

343 To swell or plasticize:

This subclass is indented under subclass 340. Processes in which a solid workpiece is treated in such a manner as to cause it to increase in size or become softer or more pliable.

SEE OR SEARCH THIS CLASS, SUBCLASS:

341, wherein solvents are employed to effect a superficial surface softening as in solvent polishing.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 130.1 for swelling or plasticization of artificial fibers.

344 **To remove entrained material from article:**
This subclass is indented under subclass 340. Processes in which the treatment results in the removal of a material which is held or retained in or on the solid workpiece.

SEE OR SEARCH THIS CLASS, SUBCLASS:
49, for removing solid bodies from a shaped body to form pores.
233, for washing of a product in combination as a subsequent disparate treatment.

SEE OR SEARCH CLASS:
8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, particularly subclasses 137+ for cleaning or laundering, per se, of textiles and fibers.
34, Drying and Gas or Vapor Contact With Solids, appropriate subclasses for separation of liquids from solids by drying.
134, Cleaning and Liquid Contact With Solids, appropriate subclasses for cleaning or separation of impurities from solid bodies.

345 **By a temperature change:**
This subclass is indented under subclass 340. Processes wherein the treatment involves a positive temperature change, other than a normal return to ambient temperatures from a heated or cooled condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
80, for processes involving a flame treatment.
234+, for a temperature change in combination as a subsequent disparate treatment.

SEE OR SEARCH CLASS:
438, Semiconductor Device Manufacturing: Process, particularly subclasses 471+ for gettering of a semiconductor substrate, subclasses 514+ for ion implantation of electrically active dopants into a semiconductive, and subclasses 795+ for thermal treatment of a semiconductor substrate to modify some property thereof.

346 **To anneal or temper:**
This subclass is indented under subclass 345. Processes in which one or more temperature changes, are employed to relieve or remove stresses or strains which may exist in a preform or self-sustaining body.

SEE OR SEARCH THIS CLASS, SUBCLASS:
235, for annealing in combination as a subsequent disparate treatment.

347 **To complete vulcanization or polymerization:**
This subclass is indented under subclass 345. Processes in which the temperature change, is employed to effect the complete vulcanization or polymerization of a partially cured self-sustaining body or preform.

(1) Note. Vulcanization, per se, or polymerization, per se, of an article is not considered to be within the scope of this subclass unless there is also included a particular manipulative or handling step or specific shape retaining or supporting step not otherwise classifiable above. See the definitions to this class, pertaining to the line between this class and the composition classes, and see also the search notes to subclass 236 of this class (264).

SEE OR SEARCH THIS CLASS, SUBCLASS:
83, for curing in a reactive atmosphere.
236, for completion of cure of an article by a subsequent disparate treatment.
280, for curing of running or indefinite length articles between pressure surfaces.
325, for curing in a closed mold.

348 **To cool:**
This subclass is indented under subclass 345. Processes directed to the cooling, per se, of a preform or self-sustaining body by a positive application of a heat extracting temperature differential.

(1) Note. Mere cooling to ambient temperature in normal surroundings of a heated article is not included within the scope of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

28, for processes including the step of cooling or freezing at 0°C or below.

237, for a positive cooling step combined as a subsequent disparate treatment.

SEE OR SEARCH CLASS:

62, Refrigeration, appropriate subclasses for specific processes of refrigerating.

349 MISCELLANEOUS:

This subclass is indented under the class definition. Miscellaneous processes not provided for specifically above.

(1) Note. Included herein are patents disclosing working, kneading or mulling, per se, of unspecified plastic materials in general, to affect the plasticity thereof. Working, kneading or mulling, per se, of specific compounds or compositions will be classified in the appropriate compound or composition class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

329, for heating or working material while moving to mold cavity.

SEE OR SEARCH CLASS:

366, Agitating, subclasses 69+ for process limited to mixing or kneading rubber or heavy plastics.

520, Synthetic Resins or Natural Rubbers, subclasses 1+ for processes which may involve the working, kneading or mulling of plastic materials classified therein. In particular, see Class 523, subclasses 100+ and Class 528, subclasses 480+.

400 LASER ABLATIVE SHAPING OR PIERCING (I.E., NONETCHING, DEVOID OF CHEMICAL AGENT OTHER THAN AIR):

This subclass is indented under the class definition. Processes directed to producing a configured or perforated article, wherein material is removed from a preform by vaporization or decomposition, caused solely by laser (i.e., light amplification by stimulated emission of radiation) generated heat and without the use of an external chemical agent, other than air.

(1) Note. Claimed recitation of laser ablative shaping, per se, without the use of an external chemical agent will be considered proper for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

138+, for processes which include a step of (a) penetrating a shaped product from one face to another to cause at least a partial separation of the product, (b) tearing an article, (c) removing material from an article by means of a solid tool or implement, or (d) forming a comminuted product, without the use of a laser.

482, for processes wherein the direct energy utilized before, during, or after shaping or molding is laser.

SEE OR SEARCH CLASS:

83, Cutting, appropriate subclasses for processes of cutting, severing, incising, etc., where not claimed in combination.

216, Etching a Substrate: Processes, subclasses 2+ for processes wherein a substrate is subjected to bombardment by high energy radiation above that of the so-called ultraviolet range.

219, Electric Heating, subclasses 121.6+ for electrical heating of metal utilizing laser.

241, Solid Material Comminution or Disintegration, appropriate subclasses for processes for solid material comminuting.

401 STEREOLITHOGRAPHIC SHAPING FROM LIQUID PRECURSOR:

This subclass is indented under the class definition. Processes directed to the application of electromagnetic wave energy on a confined

solidifiable liquid or semi-solid material which results in formation of a solid three-dimensional product.

(1) Note. In most cases the subject matter found in this subclass includes processes of producing solid three dimensional articles by application of computer directed electromagnetic wave energy in combination with polymerization and surface tension phenomena at a selected area of a confined polymerizable liquid or semi-solid material, causing a shaped integrated three-dimensional layered buildup (solidified article) to form.

(2) Note. The technology of this subclass generally includes a scanner, laser, photopolymer vat, and a controlling computer.

(3) Note. Synergistic stimulation by impinging radiation or particle bombardment, which alters the physical state of a confined fluid medium and forms a three-dimensional article (part), is considered appropriate for this subclass.

SEE OR SEARCH CLASS:

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, for processes of uniting preforms, especially subclass 58 contour or profile photography to reproduce three-dimensional objects.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, for processes of using radiation to reproduce a likeness or image of an object and see especially subclass 269, imaging affecting physical property of radiation sensitive material, or producing nonplanar or printing surface-process, composition or product.

402 DIRECT APPLICATION OF ELECTRICAL OR WAVE ENERGY TO HEAT THE MOLD (E.G., ELECTROMAGNETIC WAVE, PARTICULATE, MAGNETIC, SONIC, ELECTROSTATIC ENERGY, ETC.):

This subclass is indented under the class definition. Processes wherein electrical, electromagnetic, particulate, magnetic, sonic, induction heat, or electrostatic energy is directly applied to a mold or molding apparatus to cause said mold to be heated.

(1) Note. Some examples of wave energy found in this subclass are electromagnetic, particulate, light, sonic, supersonic, ultrasonic, gamma rays, X-rays, and magnetic energy. Particulate energy includes charged particles and atomic emissions, such as alpha rays, beta rays, and neutrons.

(2) Note. Terms listed in the glossary are denoted by an asterisk.

SEE OR SEARCH THIS CLASS, SUBCLASS:

405, for processes of molding or treating articles or processes of molding or treating precursors by direct application of electrical or wave energy.

403 Induction heating:

This subclass is indented under subclass 402. Processes wherein the mold is subjected to induction heat.

(1) Note. Induction heat is considered to be heating of a nominally electrical conducting material by eddy currents induced by a varying electromagnetic field. When an alternating current flows through a coil which surrounds or is adjacent to a nominally conducting material, eddy currents will be induced therein and cause said material to be heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

431, for processes of producing or treating inorganic material utilizing induction heating.

457, for blow molding processes utilizing induction heating.

472, for extrusion molding processes utilizing induction heating.

486, for processes wherein the directly applied energy is induction heat.

404 Electrical heating (e.g., Resistance heat, etc.):

This subclass is indented under subclass 402. Processes wherein the mold is heated by passage of electrical current through the mold which impedes current flow and results in the dissipation of power in the form of heat.

405 DIRECT APPLICATION OF ELECTRICAL OR WAVE ENERGY TO WORK (E.G., ELECTROMAGNETIC WAVE, PARTICULATE, MAGNETIC, INDUCTION HEAT, SONIC, ELECTROSTATIC ENERGY, ETC.):

This subclass is indented under the class definition. Processes directed to applying electrical, electromagnetic, magnetic, wave, or particulate energy directly to the work.

(1) Note. Some examples of wave energy found in this subclass are electromagnetic, particulate, light, sonic, supersonic, ultrasonic, gamma rays, X-rays, and magnetic energy. Particulate energy includes charged particles and atomic emissions, such as alpha rays, beta rays, and neutrons. Mere use of magnetic force employed to maintain a preform in a selected position is not provided for here, rather see subclasses 275+.

(2) Note. The energy must be applied as such to the work, the work precursor or the coating material used in a combined coating and shaping operation. Processes utilizing wave energy (e.g., plasma, etc.) to apply a coating combined with a shaping operation are properly classified in this subclass and indented subclasses. Conversion of electrical energy to heat and the application of the heat to the work is excluded from this subclass and is provided for in appropriate subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

275+, for processes of molding wherein magnetic or electrostatic force is utilized to maintain a preform in a selected position during molding and see (1) Note, above.

SEE OR SEARCH CLASS:

204, Chemistry: Electrical and Wave Energy, appropriate subclasses for a process of effecting a chemical reaction by utilizing electrical or wave energy, especially subclasses 157.15+ for a process of preparing a specific compound utilizing electrical or eave energy. The line stated in the Class 204 definition for claims defining a Class 204 operation combined with an operation for another class is to be followed for classification of claims defining both Class 204 and Class 264 operations.

522, Synthetic Resins or Natural Rubbers, subclasses 1+ for processes of preparing or treating a synthetic resin or natural rubber involving a chemical reaction brought about by the application of wave energy.

406 Measuring, testing, or inspecting:

This subclass is indented under subclass 405. Processes which includes a step of utilizing electrical, electromatic, magnetic, wave or particulate energy to audibly, chemically, mechanically, or physically determine some variable condition in a shaped article, molding material, mold or shaping surface.

(1) Note. Included herein are processes for determining imperfections or for determining completeness of a reaction or manipulation as well as determinations of undesired variations which activate correction mechanisms. Recitations of optimum or desired temperatures or pressures or proportions of ingredients are considered nominal only and are classified with the disclosed process on some other basis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

40.1, for measuring, testing, or inspecting without utilizing direct application of electrical or wave energy to work.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 407 for processes including a step of testing or

indicating combined with mechanical manufacture.

73, Measuring and Testing, appropriate subclasses for testing, per se.

162, Paper Making and Fiber Liberation, subclasses 49 and 198 for processes of testing or inspecting combined with a paper making operation.

164, Metal Founding, subclass 79 for metal casting operations employing a pore producing agent.

324, Electricity: Measuring and Testing, appropriate subclasses for electrical testing or the measuring, testing, or sensing of nonelectric properties by electric means.

436, Chemistry: Analytical and Immunological Testing, subclasses 1+ for processes of chemical testing.

407 Using sonic, supersonic, or ultrasonic energy:

This subclass is indented under subclass 406. Processes directed to utilizing wave vibrations which can be heard by the human ear.

(1) Note. Patents claiming the use of ultrasonic or supersonic frequencies (energy) are properly classified in this subclass. The term supersonic covers frequencies above the range of normal human hearing. Ultrasonic waves vibrate at frequencies beyond the hearing power of human beings (above 20,000 hertz). Sonic frequencies are vibrations which can be heard by the human ear (from about 15 hertz to approximately 20,000 hertz).

SEE OR SEARCH THIS CLASS, SUBCLASS:

69, for processes involving treatment of material by vibrating, jarring, or agitating during shaping.

442, for processes utilizing sonic energy other than measuring or testing.

408 Sensing by utilizing light or passage of electric-field current through molding material:

This subclass is indented under subclass 406. Processes wherein the variable condition is determined by using light or the passing of electrical current through a molding material.

409 Laser:

This subclass is indented under subclass 408. Processes wherein the light used is laser (i.e., light amplification by stimulated emissions of radiation).

SEE OR SEARCH THIS CLASS, SUBCLASS:

482, for processes wherein the directly applied energy is laser.

410 Infrared radiation:

This subclass is indented under subclass 408. Processes wherein the light used is infrared.

(1) Note. Infrared radiation, measured using the electromagnetic wave spectrum, is that portion which is visible to the eye, lying between wavelengths of 750 nm (0.75 micrometers) and about 1 mm (1000 micrometers).

SEE OR SEARCH THIS CLASS, SUBCLASS:

458, for blow molding processes utilizing infrared radiation.

462, for processes of uniting particles utilizing infrared radiation.

476, for extrusion molding processes utilizing infrared radiation.

481, for processes of reshaping, drawing or stretching utilizing infrared radiation.

492, for processes wherein the applied energy is infrared radiation.

411 Measuring weight or volume (e.g., level-responsive, etc.):

This subclass is indented under subclass 408. Processes wherein the weight or volume of the molding material is measured.

(1) Note. Operations including maintaining a container at a desired capacity are proper for this subclass.

412 Controlling rate of movement of molding material or its support in a continuous process:

This subclass is indented under subclass 408. Processes wherein the movement of the molding material or a substrate supporting the molding material in a continuous process is controlled.

(1) Note. Controlled continuous processes found in this subclass include (a) a set up for repetitive operations or (b) endless flow operations, wherein molding material leaves the molding cavity.

413 Producing or treating porous product:
This subclass is indented under subclass 405. Processes wherein the directly applied energy is used (a) to form pores or voids in an article or (b) for the treatment* of a porous article.

(1) Note. Pore forming when not combined with significant molding is provided for in various classes and the general lines between those classes and Class 264 is followed even though the step of forming pores is recited.

(2) Note. Included within the scope of this subclass and indented subclasses are enlarging voids already present in a material by expanding gases contained therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41, For processes of forming pores or voids without using the direct application of electrical or wave energy.
317, for processes, generally, which involve the destruction of material which may leave a space or void.
321, for processes of reshaping previously foamed material.
610, for processes of burning, vaporizing, or melting of embedded element or core to form a nonrandom void
628, for processes of producing microporous articles without intentionally occluding or incorporating void forming elements randomly throughout the forming material.

SEE OR SEARCH CLASS:

51, Abrasive Tool Making Process, Material, or Composition, subclass 296 for pore forming in abrasive materials.
106, Compositions: Coating or Plastic, subclasses 122, 601+, and 672+ for pore forming, per se, in compositions within the definitions of the class.
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 77+ for a pore forming step in combination with a laminating operation.
162, Paper Making and Fiber Liberation, subclass 101 for a pore forming step within the class definition.
366, Agitating, subclasses 3+ for a step of utilizing gas in mixing mortar.
501, Compositions: Ceramic, subclasses 39 and 80+ for pore-forming ceramic compositions.
521, Synthetic Resins or Natural Rubbers, subclasses 50+ for pore forming, per se, in a synthetic resin or natural resin composition.
588, Hazardous or Toxic Waste Destruction or Containment, subclass 255 for the forming of pores or voids in the production of a material containing hazardous or toxic waste for purposes of containment.

414 Inorganic material containing:
This subclass is indented under subclass 413. Processes wherein the pore forming material or porous article contains inorganic material.

(1) Note. Inorganic porous material having minimal or trace amounts of organic material (e.g., resinous binders, etc.) are properly classified here.

(2) Note. Attention is directed to the definition of Class 260 for the distinction between the term “organic” and “inorganic.”

415 Including in situ (e.g., foaming):
This subclass is indented under subclass 413. Processes wherein the pore containing article or material is produced by on site foaming.

416 Using liquid to gas blowing agent:
This subclass is indented under subclass 415. Processes in which the pores or voids are formed by using a liquid blowing agent whose state changes from liquid to gas (i.e., vaporization of a liquid incorporated into the molding material).

SEE OR SEARCH THIS CLASS, SUBCLASS:

53, for processes in which voids are formed by a liquid to gas change of state without using directly applied electrical or wave energy.

417 Microwave (e.g., 2.45 gigahertz, etc.):

This subclass is indented under subclass 416. Processes in which the directly applied energy is identified on the electromagnetic wave spectrum as existing between far infrared and conventional radio-frequency.

(1) Note. A microwave is generally considered to be an electromagnetic wave which has a wavelength measured in the centimeter range. Microwaves occupy a region in the electromagnetic wave spectrum between infrared and radio-frequency. There are no distinct boundaries between these regions except by arbitrary definition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

420, for processes of using blowing agents to form porous products utilizing microwave energy.

432, for processes of treating inorganic material utilizing microwave energy.

474, for extrusion molding processes utilizing microwave energy.

489, for processes wherein the energy directly applied is microwave.

418 Radio frequency (e.g., 13.56 megahertz, etc.):

This subclass is indented under subclass 416. Processes wherein the directly applied energy is identified on the electromagnetic wave spectrum as existing between 150 KHz and extending up to the infrared region.

SEE OR SEARCH THIS CLASS, SUBCLASS:

421, for processes of using blowing agents to form porous products utilizing radio frequency wave energy.

422, for processes of utilizing radio frequency wave energy to form porous products.

475, for extrusion molding processes utilizing radio frequency wave energy.

491, for processes wherein the energy directly applied is radio frequency wave.

419 Using chemical blowing agent:

This subclass is indented under subclass 415. Processes in which pores or voids are formed by the generation of a gas, by a chemical reaction of gas producing reactants, or by agents incorporated in the molding material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

54, for processes of forming voids or pores utilizing gas producing reactants without using directly applied electrical or wave energy.

420 Microwave (e.g., 2.45 gigahertz, etc.):

This subclass is indented under subclass 419. Processes in which the directly applied energy is identified on the electromagnetic wave spectrum as existing between far infrared and conventional radio frequency.

(1) Note. A microwave is generally considered to be an electromagnetic wave which has a wavelength measured in the centimeter range. Microwaves occupy a region in the electromagnetic wave spectrum between infrared and radio-frequency. There are no distinct boundaries between these regions except by arbitrary definition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

432, for processes of treating inorganic material utilizing microwave energy.

474, for extrusion molding processes utilizing microwave energy.

489, for processes wherein the energy directly applied is microwave.

421 Radio frequency (e.g., 13.56 megahertz, etc.):

This subclass is indented under subclass 419. Processes wherein the directly applied energy is identified on the electromagnetic wave spectrum as existing between 150 KHz and extending up to the infrared region.

SEE OR SEARCH THIS CLASS, SUBCLASS:

422, for processes of utilizing radio frequency wave energy to form porous products.

475, for extrusion molding processes utilizing radio frequency wave energy.

491, for processes wherein the energy directly applied is radio frequency wave.

422 Radio frequency (e.g., 13.56 megahertz, etc.):

This subclass is indented under subclass 415. Processes wherein the directly applied energy is identified on the electromagnetic wave spectrum as existing between 150 KHz and extending up to the infrared region.

SEE OR SEARCH THIS CLASS, SUBCLASS:

475, for extrusion molding processes utilizing radio frequency wave energy.

491, for processes wherein the energy directly applied is radio frequency wave.

423 Plasma (e.g., corona, glow discharge, etc.):

This subclass is indented under subclass 413. Processes wherein the energy directly applied consists of a gaseous vapor of ions in equilibrium or a vapor of ions in vacuum in a non-equilibrium state referred to as a "cold plasma."

(1) Note. Generally a plasma consists of a wholly or partially ionized gas composed of ions, electrons, and neutral particles. The concentration of negatively and positively charged carriers are approximately equal.

SEE OR SEARCH THIS CLASS, SUBCLASS:

455, for blow molding processes utilizing plasma.

469, for extrusion molding processes utilizing plasma.

483, for processes wherein the directly applied energy is plasma.

424 Utilizing electron arc or electron beam:

This subclass is indented under subclass 413. Processes wherein the energy applied consists of (a) a prolonged electrical discharge or series of prolonged electrical discharges between two electrodes or (b) a narrow stream of electrons moving in the same direction, and at the same speed, under the influence of an electric or magnetic field.

SEE OR SEARCH THIS CLASS, SUBCLASS:

456, for blow molding processes utilizing electron arc or beam.

470, for extrusion molding processes utilizing electron arc or beam.

485, for processes wherein an electron arc or beam is the energy directly applied.

425 Polymerizing, cross-linking, or curing:

This subclass is indented under subclass 413. Processes wherein the material used to produce or treat the porous product is caused to polymerize, cross-link, or cure.

(1) Note. Properly classified herein are documents claiming the following terms. a. cross-linking b. curing c. addition polymerization d. condensation polymerization e. block or graft polymerization. This list is not intended to be exhaustive and is not limited to the above examples.

SEE OR SEARCH THIS CLASS, SUBCLASS:

459, for blow molding processes wherein polymerization occurs.

463, for uniting particles to form articles wherein polymerization occurs.

477, for extrusion molding processes wherein polymerization occurs.

494, for processes wherein polymerization occurs utilizing directly applied electrical or wave energy.

426 Producing or treating inorganic hydro-settable material (e.g., cement, plaster, etc.):

This subclass is indented under subclass 405. Processes wherein the energy directly applied is utilized for the treatment* of or formation of inorganic materials which are capable of being hydrolyzed by water to a solid state.

(1) Note. Inorganic hydro-settable material having minimal or trace amounts of organic material are properly classified here.

(2) Note. This subclass includes compositions made without any melting or fusion of particles, as well as those made by sintering, that is, a process in which a portion of a nonmetallic particle is bonded, coalesced, or partly fused to a portion of an adjacent particle due to the application of heat or heat and pressure.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, subclasses 638+ for coating compositions containing an inorganic settable material.

427 Producing or treating magnetic product or precursor thereof:

This subclass is indented under subclass 405. Processes wherein the energy directly applied is utilized for the (a) treatment* or formation of a magnetic article or (b) treatment* or production of material to be used to make said article.

SEE OR SEARCH CLASS:

252, Compositions, subclasses 62.51+ for processes of preparing magnetic compositions and the compositions resulting therefrom, as well as such processes followed by a magnetizing and/or a nominal or broad molding step.

428 Including vitrifying or sintering (e.g., fusing, firing, burning, etc.):

This subclass is indented under subclass 427. Processes wherein the magnetic product is subjected to temperatures sufficiently high (with or without pressure) which causes said article to, at least partially, coalesce or fuse.

(1) Note. The term firing recited in a patent is considered to read on either sintering or vitrifying and is included herein, unless the firing is disclosed as being for some other purpose or at a clearly too low or inadequate temperature to accomplish sintering or vitrifying. Firing to render a mass friable (calcining) or firing at a temperature only sufficient to drive out the moisture content would, for example, be excluded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

125+, for processes of sintering or heat fusion of particles to autogenously bond, without the use of electrical, particulate or wave energy.

239+, for processes of sintering or heat fusion of particles wherein the particulate material is completely melted, without the use of electrical, particulate, or wave energy.

434, for processes of sintering or vitrifying inorganic material.

603+, for processes of sintering or vitrifying a shaped inorganic preform external of a mold, without the use of electrical, particulate, or wave energy.

429 Uniting magnetic particles utilizing organic binder (e.g., resinous binders, etc.):

This subclass is indented under subclass 427. Processes wherein magnetic small grains, pellets or beads, are adhesively joined using an organic material.

(1) Note. Attention is directed to the definition of Class 260 for the distinction between the term “organic” and “inorganic.”

430 Producing or treating inorganic material, not as pigments, conductive enhancers, or fillers (e.g., ceramic, refractory material, etc.):

This subclass is indented under subclass 405. Processes wherein the energy directly applied is used in the treatment* of or formation of inorganic material other than as pigments, conductive enhancers or fillers.

(1) Note. Inorganic material containing minimal or trace amounts of organic material (e.g.,resinous binders, etc.) are properly classified here.

(2) Note. Attention is directed to the definition of Class 260 for the distinction between the term “organic” and “inorganic.”

SEE OR SEARCH THIS CLASS, SUBCLASS:

450, for processes utilizing organic material which contains small amounts of inorganic material as pigments, conductive enhancers, or fillers.

431 Induction heating:

This subclass is indented under subclass 430. Processes wherein the inorganic material is subjected to induction heat.

(1) Note. Induction heat is considered to be heating of a nominally electrical conducting material by eddy currents induced by a varying electromagnetic field. When an alternating current flows through a coil surrounding or adjacent a nominally conducting material, eddy currents will be induced therein, causing said material to be heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

457, for blow molding processes utilizing induction heating.

472, for extrusion molding processes utilizing induction heating.

486, for processes wherein the directly applied energy is induction heat.

432 Microwave (e.g., 2.45 gigahertz, etc.):

This subclass is indented under subclass 416. Processes in which the directly applied energy, is identified on the electromagnetic wave spectrum, as existing between far infrared and conventional radio-frequency.

(1) Note. A microwave is generally considered to be an electromagnetic wave which has a wavelength measured in the centimeter range. Microwaves occupy a region in the electromagnetic wave spectrum between infrared and radio-frequency. There are no distinct boundaries between these regions except by arbitrary definition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

474, for extrusion molding processes utilizing microwave energy.

489, for processes wherein the energy directly applied is microwave.

433 Including extruding (e.g., spinning, etc.):

This subclass is indented under subclass 430. Processes wherein the inorganic material is shaped by forcing it through a confining orifice.

SEE OR SEARCH THIS CLASS, SUBCLASS:

176.1+, for processes of forming continuous or indefinite length articles, per se, by extrusion through a shaping orifice.

323, for processes of extruding finite articles, per se.

452, for processes of extruding material wherein an electrode is part of the extruding shaping surface.

434 Including vitrifying or sintering (e.g., fusing, firing, burning, etc.):

This subclass is indented under subclass 430. Processes wherein the inorganic material thereof is subjected to temperatures sufficiently high (with or without pressure) which causes said material to, at least partially, coalesce or fuse.

SEE OR SEARCH THIS CLASS, SUBCLASS:

125+, for processes of sintering or heat fusion of particles to autogenously bond, without the use of electrical, particulate or wave energy.

239+, especially subclass 332, for processes of sintering or heat fusion of particles wherein the particulate material is completely melted, without the use of electrical, particulate or wave energy.

603+, for processes of sintering a shaped inorganic preform external of a mold and without the use of electrical, particulate or wave energy.

435 Molecular aligning or molecular orientating (e.g., poling, etc.):

This subclass is indented under subclass 405. Processes wherein the energy directly applied is used to direct, shift, or arrange molecules, of the molding material, in a particular order.

436 Producing permanently polarized dielectric (e.g., electret, etc.):
This subclass is indented under subclass 435. Processes wherein the arranged molecular alignment results in a fixed polarized dielectric product.

437 Conveying or aligning particulate material:
This subclass is indented under subclass 405. Processes wherein the directly applied energy is used to transport, arrange, or order small discrete pieces, grains, pellets, or beads.

SEE OR SEARCH CLASS:
204, Chemistry: Electrical and Wave Energy, subclasses 450+ for processes employing electrophoresis or electro-osmosis.

438 Utilizing electrostatic charge:
This subclass is indented under subclass 437. Processes directed to using electrical energy having a constant-intensity electric charge which results in the capability of attracting and holding small particles having an opposite electrical charge.

(1) Note. Electrostatic charge is generally considered to be an electric charge that is in a state of equilibrium.

439 Simultaneously with molding:
This subclass is indented under subclass 438. Processes wherein the particles are aligned or conveyed concurrently with the molding operation.

440 Forming composite structure:
This subclass is indented under subclass 439. Processes wherein the particulate material is arranged to form at least two different, contiguous layers or portions, each having a continuous phase (e.g., plural, adjacent, spacial distinct layers, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:
480, for reshaping, drawing, or stretching a composite work-piece.
487, for treating or heating a composite work-piece utilizing induction heat.
490, for treating a composite work-piece utilizing microwave energy.
493, for treating a composite work-piece utilizing infrared radiation.

441 Producing filament:
This subclass is indented under subclass 439. Processes wherein a fine threadlike body or structure whose width and thickness are of the same order of magnitude is formed.

442 Using sonic, supersonic, or ultrasonic energy:
This subclass is indented under subclass 405. Processes directed to utilizing wave vibrations which cover the use of (a) frequencies above the range of normal human hearing, usually above 20,000 hertz and below radio waves (i.e., supersonic or ultrasonic), or (b) frequencies which can be heard by the human ear (from about 15 hertz to approximately 20,000 hertz).

SEE OR SEARCH THIS CLASS, SUBCLASS:
69, for processes involving treatment of material by vibrating, jarring, or agitating during shaping and wherein the frequency is not specified.

443 Simultaneously with molding:
This subclass is indented under subclass 442. Processes wherein the sonic energy is employed concurrently with the molding operation.

444 Producing articles of indefinite length:
This subclass is indented under subclass 443. Processes wherein self-sustaining continuous articles or running length bodies are formed.

445 Fusion bonding of preformed bodies and shaping at the joint:
This subclass is indented under subclass 443. Processes wherein at least two plastically deformable self-sustaining bodies are assembled and autogenously united at a joint area by a shaping operation with plastic flow to reshape said bodies at said joint area.

446 Limited to treatment* of surface or coated surface:
This subclass is indented under subclass 405. Processes wherein at least one treatment step is applied to a surface or coated surface only.

447 Treatment* of coated surface:
This subclass is indented under subclass 446. Processes wherein only the coated surface is treated.

448 Of indefinite length article:
This subclass is indented under subclass 446. Processes wherein the treated surface is that of a self-sustaining continuous article or running length body.

449 Using direct contact of electrode or electrical wire with precursor or workpiece:
This subclass is indented under subclass 405. Processes , wherein electrical current is caused to flow through a precursor or a workpiece by directly contacting said precursor or workpiece with an electrode or wire.

(1) Note. The electrode or wire may either remain as a part of the workpiece or be detached therefrom.

450 Organic material contains specified conductive enhancing component (e.g., filler, etc.):
This subclass is indented under subclass 449. Processes wherein the precursor or workpiece contains an identified electroconductive material which aids the current flow.

(1) Note. Organic material which contains small amounts of inorganic material as conductive enhancers are properly classified here.

451 Shaping surface constitutes electrode:
This subclass is indented under subclass 449. Processes wherein one of the electrodes provides the shaping function.

(1) Note. Processes wherein at least one electrode comprises the shaping surface are found herein.

452 Including extrusion molding:
This subclass is indented under subclass 451. Processes wherein a material is shaped or molded by forcing it through a confining orifice.

SEE OR SEARCH THIS CLASS, SUBCLASS:
176.1+, for processes of forming continuous or indefinite length articles, per se, by extrusion through a shaping orifice.
323, for processes of extruding finite articles, per se.
464, for extruding processes, per se, utilizing direct application of electrical or wave energy.

453 Including injection molding:
This subclass is indented under subclass 451. Processes wherein pressure is applied to a molding material so as to force said material from a source removed from a closed mold cavity into said cavity wherein the material assumes the shape of the interior of the closed cavity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
478, for injection molding, per se, utilizing direct application of electrical or wave energy.
537, for injection molding of a hollow blank portion prior to pneumatic pressure application to the inside.

454 Direct application of fluid pressure (e.g., blow molding, etc.):
This subclass is indented under subclass 405. Processes wherein a positive or negative pressure is applied through the medium of a liquid or gas, in direct contact with a workpiece.

455 Plasma (e.g., corona, glow discharge, etc.):
This subclass is indented under subclass 454. Processes wherein the energy applied consists of a gaseous vapor of ions in equilibrium or a vapor of ions in vacuum in a nonequilibrium state referred to as a “cold plasma.”

(1) Note. A plasma generally consists of a wholly or partially ionized gas composed of ions, electrons, and neutral particles. The concentration of negatively and positively charged carriers are approximately equal.

SEE OR SEARCH THIS CLASS, SUBCLASS:

469, for extrusion molding processes utilizing plasma.

483, for processes wherein the directly applied energy is plasma.

456 Utilizing electron arc or electron beam:

This subclass is indented under subclass 454. Processes wherein the energy applied consists of (a) a prolonged electrical discharge or series of prolonged electrical discharges between two electrodes or (b) a narrow stream of electrons, moving in the same direction and at the same speed under the influence of an electric or magnetic field.

SEE OR SEARCH THIS CLASS, SUBCLASS:

470, for extrusion molding processes utilizing electron arc or beam.

485, for processes wherein an electron arc or beam is the energy directly applied.

457 Induction heating:

This subclass is indented under subclass 454. Processes wherein the material to be molded is subjected to induction heat.

(1) Note. Induction heat is considered to be heating of a nominally electrical conducting material by eddy currents induced by a varying electromagnetic field. When an alternating current flows through a coil surrounding or adjacent a nominally conducting material, eddy currents will be induced therein, causing said material to be heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:

472, for extrusion molding processes utilizing induction heating.

486, for processes wherein the directly applied energy is induction heat.

458 Infrared radiation:

This subclass is indented under subclass 454. Processes wherein the energy applied is considered to have a frequency range with wavelengths longer than those of visible light and shorter than those of radio waves.

(1) Note. Infrared radiation, measured using the electromagnetic wave spectrum, is that portion which is visible to the eye, lying between wavelengths of 750 nm (0.75 micrometers) and about 1 mm (1000 micrometers).

SEE OR SEARCH THIS CLASS, SUBCLASS:

462, for processes of uniting particles utilizing infrared radiation.

476, for extrusion molding processes utilizing infrared radiation.

481, for processes of reshaping, drawing or stretching utilizing infrared radiation.

492, for processes wherein the applied energy is infrared radiation.

459 Polymerizing, cross-linking, or curing:

This subclass is indented under subclass 454. Processes wherein the molding material is caused to polymerize, cross-link, or cure.

(1) Note. Properly classified herein are documents claiming the following terms. a. cross-linking b. curing c. addition polymerization d. condensation polymerization e. block or graft polymerization. This list is not intended to be exhaustive and is not limited to the above examples.

SEE OR SEARCH THIS CLASS, SUBCLASS:

463, for uniting particles to form articles wherein polymerization occurs.

477, for extrusion molding processes wherein polymerization occurs.

494, for processes wherein polymerization occurs utilizing directly applied electrical or wave energy.

460 Forming articles by uniting randomly associated particles:

This subclass is indented under subclass 405. Processes wherein the energy applied is used to bond individually distinct particles to each other or through a binder.

(1) Note. The relative sizes of the particles are immaterial; however, the particles must retain their discrete nature during the associating and bonding operation. Further, the mere presence of particles in

a liquid carrier is not sufficient for this subclass (e.g., fillers or slurries), this being considered to be the molding of a fluent or liquid mass rather than the association of particles and is provided for in appropriate subclasses below.

(2) Note. The material is usually, but not necessarily, in the form of fibers or granules and bonding of the particulate material may be effected by applying an adhesive or by the latent adhesive characteristics of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

131, for a molding process combined with a step of coating with particulate material.

239+, for processes of molding (a) plastic compositions containing particulate material as a filler or (b) colloidal or nonsettling dispersions (e.g., rubber latex or clay) or (c) plastic particulate material which lose their identity during molding to form a homogeneous product and see (1) Note, above.

517, for processes of applying vacuum or suction to bulk assembled particles.

SEE OR SEARCH CLASS:

19, Textiles: Fiber Preparation, subclasses 144+ for a process of bringing particles together, for example by air laying, and see the notes in subclasses 144+ for the line between Class 264 and Class 19.

23, Chemistry: Physical Processes, subclasses 313+ for agglomerating processes provided for in that class.

44, Fuel and Related Compositions, subclasses 550+ for a solid fuel consolidation or shaping process which goes beyond mere molding of a starting composition, especially subclasses 596+ for a process which includes pressing using a specified condition or technique.

51, Abrasive Tool Making Process, Material, or Composition, subclasses 293+ for processes of making abrading tools, the materials, or compositions used therein.

65, Glass Manufacturing, subclasses 3.1+ and 4.1+ for a process of forming glass fibers from a glass melt and adhesively bonding the fibers by any bonding medium or autogenously to form a glass fiber felt and subclasses 36+ for a process of fusing glass fibers or particles to each other to form a felt. See also the main definition of Class 264 for a further statement of the line with Class 65.

75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, see especially the notes thereto for the locus of other art relating to particle uniting and subclasses 228+ for a consolidated metal particle composition.

100, Presses, subclasses 35+ for a method of intermingling and/or deforming particulate material to mechanically unite the particles together at their respective interfaces without use of a binder.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 62.2 for a process of forming a felted article by simultaneously uniting of particles combined with the step of adhesively bonding the felted article to another part.

162, Paper Making and Fiber Liberation, subclasses 100+ for a process of forming an interfelted fibrous product (e.g., paper interfelted fibrous product, paper from a liquid fibrous suspension, etc.).

201, Distillation: Processes, Thermolytic, subclasses 5+ for a process for a mechanical pressing or briquetting of solid carbonaceous material combined with a thermolytic distillation operation.

419, Powder Metallurgy Processes, subclasses 61+ processes for making articles from metal particles by pressure without heat and subclass 1 for similar processes which use heat.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 80.1+ for corresponding apparatus.

427, Coating Processes, subclass 180 for processes of coating utilizing solid particles or fibers.

428, Stock Material or Miscellaneous Articles, subclass 87 for a product with a pile or nap type surface and including particulate matter, subclasses 143+ for a stock material in the form of a single or plural layer web or sheet which has a textured or rough surface comprising particulate matter, subclasses 323+ for a composite web or sheet including a component having structurally defined particles, and subclasses 402+ for structurally defined or coated particles.

461 Utilizing electron arc or electron beam:
This subclass is indented under subclass 460. Processes wherein the energy applied consists of a (a) prolonged electrical discharge or series of prolonged electrical discharges between two electrodes or (b) narrow stream of electrons moving in the same direction, and at the same speed, under the influence of an electric or magnetic field.

SEE OR SEARCH THIS CLASS, SUBCLASS:

470, for extrusion molding processes utilizing electron beam.

485, for processes wherein an electron arc or beam is the directly applied energy.

462 Infrared radiation:
This subclass is indented under subclass 460. Processes wherein the energy applied is considered to have a frequency range with wavelengths longer than those of visible light and shorter than those of radio waves.

(1) Note. Wave energy measured using the electromagnetic spectrum, having a portion which is visible to the eye, lying between wavelengths of 750 nm (0.75 micrometers) and about 1 mm (1000 micrometers) are properly classified here as infrared.

SEE OR SEARCH THIS CLASS, SUBCLASS:

476, for extrusion molding processes utilizing infrared radiation.

481, for processes of reshaping, drawing, or stretching utilizing infrared radiation.

492, for processes wherein the applied energy is infrared radiation.

463 Polymerizing, cross-linking, or curing:
This subclass is indented under subclass 460. Processes wherein the molding material is caused to polymerize, cross-link, or cure.

(1) Note. Properly classified herein are documents claiming the following terms. a. cross-linking b. curing c. addition polymerization d. condensation polymerization e. block or graft polymerization. This list is not intended to be exhaustive and is not limited to the above examples.

SEE OR SEARCH THIS CLASS, SUBCLASS:

477, for extrusion molding processes wherein polymerization, cross-linking, or curing occurs.

494, for processes wherein polymerization, cross-linking, or curing occurs utilizing directly applied electrical or wave energy.

464 Extrusion molding:
This subclass is indented under subclass 405. Processes wherein an article is shaped or formed by extruding or forcing a supply of the article forming material through a confining and shaping orifice.

SEE OR SEARCH CLASS:

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 376.1+ for an extrusion shaping machine for nonmetals and see the search notes thereunder.

465 Utilizing electrostatic charge, field, or force (e.g., pinning, etc.):
This subclass is indented under subclass 464. Processes wherein the energy used is static electrical or a force or field created thereby.

(1) Note. Electrostatic energy is considered to be a form of electrical energy which has the capability of attracting and holding small particles having an opposite electrical charge.

(2) Note. An electrostatic charge is an electric charge stored in a capacitor or on the surface of an insulated object.

(3) Note. An electrostatic field is considered to be the vector force field set up in the vicinity of nonmoving electrical charges.

466 On film, sheet or web:
This subclass is indented under subclass 465. Processes wherein the extruded material forms on a portion of material of finite length, whose width is greater than its thickness and which may be of any geometric shape (e.g., triangle, circle, etc.).

467 Plural electrodes spaced between the extruding means and the shaping surface:
This subclass is indented under subclass 466. Processes wherein more than one electrode is located between an extruding orifice and a shaping surface.

468 Including differential fluid pressure application (e.g., vacuum etc.):
This subclass is indented under subclass 466. Processes wherein a change in fluid pressure is applied.

SEE OR SEARCH THIS CLASS, SUBCLASS:
500+, and 335, for other art relating to the application of fluid pressure differential to the work.

469 Plasma (e.g., corona, glow discharge, etc.):
This subclass is indented under subclass 464. Processes wherein the energy applied consists of a gaseous vapor of ions in equilibrium or a vapor of ions in vacuum in a nonequilibrium state referred to as a "cold plasma."

(1) Note. A plasma, generally consists of a wholly or partially ionized gas composed of ions, electrons, and neutral particles. The concentration of negatively and positively charged carriers are approximately equal.

SEE OR SEARCH THIS CLASS, SUBCLASS:
483, for processes wherein the directly applied energy is plasma.

470 Utilizing electron arc or electron beam:
This subclass is indented under subclass 464. Processes wherein the energy applied consists of (a) a prolonged electrical discharge or series of prolonged electrical discharges between two electrodes or (b) a narrow stream of electrons moving in the same direction, and at the same speed, under the influence of an electric or magnetic field.

SEE OR SEARCH THIS CLASS, SUBCLASS:
485, for processes wherein an electron arc or beam is the energy directly applied.

471 Layered or structurally layered composite:
This subclass is indented under subclass 470. Processes wherein the treated composite has more than one layer each of which may be structured.

472 Induction heating:
This subclass is indented under subclass 464. Processes wherein the extrusion material is subjected to induction heat.

(1) Note. Induction heat is considered to be heating of a nominally electrical conducting material by eddy currents induced by a varying electromagnetic field. When an alternating current flows through a coil surrounding or adjacent a nominally conducting material, eddy currents will be induced therein, causing said material to be heated.

SEE OR SEARCH THIS CLASS, SUBCLASS:
486, for processes wherein the directly applied energy is induction heat.

473 High energy or particulate radiation (e.g., X-ray, gamma ray, neutron, etc.):
This subclass is indented under subclass 464. Processes wherein the directly applied energy is irradiation with high energy electromagnetic radiation or high energy particles.

(1) Note. The term high energy electromagnetic radiation or high energy particles, as employed here, includes X-rays, gamma rays, and particulate energy (i.e., charged particles and atomic emissions such as alpha rays, beta rays, and neutrons). Electromagnetic wave energy measured below wavelengths of 100 Angstroms (10 to the minus 8 meters) will be considered high energy electromagnetic radiation or high energy particle radiation. This subject matter is often referred to as high energy ionizing radiation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

488, for processes wherein high energy electromagnetic or particulate radiation is the energy directly applied.

474 Microwave (e.g., 2.45 gigahertz, etc.):

This subclass is indented under subclass 464. Processes wherein the directly applied energy is identified on the electromagnetic wave spectrum as existing between far infrared and conventional radio-frequency.

(1) Note. A microwave is generally considered to be an electromagnetic wave which has a wavelength measured in the centimeter range. Microwaves occupy a region in the electromagnetic wave spectrum between infrared and radio-frequency. There are no distinct boundaries between these regions except by arbitrary definition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

489, for processes wherein the energy directly applied is microwave.

475 Radio frequency (e.g., 13.56 megahertz, etc.):

This subclass is indented under subclass 464. Processes wherein the directly applied energy is identified on the electromagnetic wave spectrum as existing between 150 KHz and extending up to the infrared region.

SEE OR SEARCH THIS CLASS, SUBCLASS:

491, for processes wherein the energy directly applied is radio frequency wave.

476 Infrared radiation:

This subclass is indented under subclass 464. Processes wherein the energy applied is considered to have a frequency range with wavelengths longer than those of visible light and shorter than those of radio waves.

(1) Note. Wave energy measured using the electromagnetic spectrum, having a portion which is visible to the eye, lying between wavelengths of 750 nm (0.75 micrometers)and about 1 mm (1000 micrometers) are properly classified here as infrared.

SEE OR SEARCH THIS CLASS, SUBCLASS:

481, for processes of reshaping, drawing, or stretching utilizing infrared radiation.

492, for processes wherein the applied energy is infrared radiation.

477 Polymerizing, cross-linking, or curing:

This subclass is indented under subclass 464. Processes wherein the molding material is caused to polymerize, cross-link, or cure.

(1) Note. Properly classified herein are documents claiming the following terms. a. cross-linking b. curing c. addition polymerization d. condensation polymerization e. block or graft polymerization. This list is not intended to be exhaustive and is not limited to the above examples.

SEE OR SEARCH THIS CLASS, SUBCLASS:

494, for processes wherein polymerization occurs utilizing directly applied electrical or wave energy.

478 Injection molding:

This subclass is indented under subclass 405. Processes wherein pressure is applied to a molding material so as to force said material from a source removed from a closed mold

cavity into said cavity wherein the material assumes the shape of the interior of the closed cavity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
328.1+, for injection molding without electrical or wave energy.
537, for injection molding of a hollow blank portion prior to pneumatic pressure application to the inside.

479 Reshaping, drawing or stretching:
This subclass is indented under subclass 405. Processes wherein the energy is applied during any stage of an operation to reconfigure, lengthen, or elongate a moldable material.

480 Composite work-piece:
This subclass is indented under subclass 479. Processes wherein the reconfigured, lengthened or elongated material comprises at least two different, contiguous layers or portions, each having a continuous phase (e.g., plural, adjacent, spacial distinct layers, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:
487, for treating or heating a composite work-piece utilizing induction heat.
490, for treating a composite work-piece utilizing microwave energy.
493, for treating a composite work-piece utilizing infrared radiation.

481 Infrared radiation:
This subclass is indented under subclass 479. Processes wherein the energy applied is considered to have a frequency range with wavelengths longer than those of visible light and shorter than those of radio waves.

(1) Note. Wave energy measured using the electromagnetic spectrum, having a portion which is visible to the eye, lying between wavelengths of 750 nm (0.75 micrometers) and about 1 mm (1000 micrometers) are properly classified here as infrared.

SEE OR SEARCH THIS CLASS, SUBCLASS:
492, for processes wherein the directly applied energy is infrared radiation.

482 Laser:
This subclass is indented under subclass 405. Processes wherein the energy directly applied is a narrow beam of coherent light (light amplification by stimulated emissions of radiation).

SEE OR SEARCH CLASS:
219, Electric Heating, subclasses 121.11+ for processes utilizing electric heat energy, per se, wherein the heat source is an electron beam, plasma, arc, laser, etc.

483 Plasma (e.g., corona, glow discharge, etc.):
This subclass is indented under subclass 405. Processes wherein the energy directly applied consists of a gaseous vapor of ions in equilibrium or a vapor of ions in vacuum in a non-equilibrium state referred to as a “cold plasma.”

(1) Note. A plasma, generally consists of a wholly or partially ionized gas composed of ions, electrons, and neutral particles. The concentration of negatively and positively charged carriers are approximately equal.

484 Utilizing electrostatic charge, field, or force (e.g., pinning, etc.):
This subclass is indented under subclass 405. Processes wherein the energy used is static electrical or the force or field created thereby.

(1) Note. Electrostatic energy is considered to be a form of electrical energy which has the capability of attracting and holding small particles having an opposite electrical charge.

(2) Note. An electrostatic charge is considered to be electric energy stored in a capacitor or on the surface of an insulated object.

(3) Note. An electrostatic field is considered to be the vector force field set up in the vicinity of non-moving electrical charges.

485 Utilizing electron arc or electron beam:
This subclass is indented under subclass 405. Processes wherein the energy applied consists of (a) a prolonged electrical discharge or series of prolonged electrical discharges between two electrodes or (b) a narrow stream of electrons moving in the same direction, and at the same speed, under the influence of an electric or magnetic field.

486 Induction heating:
This subclass is indented under subclass 405. Processes wherein the material is subjected to induction heat.

(1) Note. Induction heat is considered to be heating of a nominally electrical conducting material by eddy currents induced by a varying electromagnetic field. When an alternating current flows through a coil surrounding or adjacent a nominally conducting material, eddy currents will be induced therein, causing said material to be heated.

487 Composite work-piece:
This subclass is indented under subclass 486. Processes wherein the induction heat is directly applied to a work-piece comprising at least two different, contiguous layers or portions, each having a continuous phase (e.g., plural, adjacent, spacial distinct layers, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:
490, for treating a composite work-piece utilizing microwave energy.
493, for treating a composite work-piece utilizing infrared radiation.

488 High energy or particulate radiation (e.g., X-ray, gamma ray, neutron, etc.):
This subclass is indented under subclass 405. Processes wherein the directly applied energy is irradiation with high energy electromagnetic radiation or high energy particles.

(1) Note. The term high energy electromagnetic radiation or "high energy particles," as employed here, includes X-rays, gamma rays, and particulate energy (i.e., charged particles and atomic emissions such as alpha rays, beta rays, and neutrons). Electromagnetic wave energy measured below wavelengths of 100 Angstroms (10 to the minus 8 meters) will be considered "high energy electromagnetic radiation" or "high energy particle radiation." This subject matter is often referred to as "high energy ionizing radiation."

489 Microwave (e.g., 2.45 gigahertz, etc.):
This subclass is indented under subclass 405. Processes wherein the directly applied energy is identified on the electromagnetic wave spectrum as existing between far infrared and conventional radio-frequency.

(1) Note. A microwave is generally considered to be an electromagnetic wave which has a wavelength measured in the centimeter range. Microwaves occupy a region in the electromagnetic wave spectrum between infrared and radio-frequency. There are no distinct boundaries between these regions except by arbitrary definition.

490 Composite work-piece:
This subclass is indented under subclass 489. Processes wherein the microwave energy is directly applied to a workpiece comprising at least two different, contiguous layers or portions, each having a continuous phase (e.g., plural, adjacent, spacial distinct layers, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:
493, for treating a composite work-piece utilizing infrared radiation.

491 Radio frequency (e.g., 13.56 megahertz, etc.):
This subclass is indented under subclass 405. Processes wherein the directly applied energy is identified on the electromagnetic wave spectrum as existing between 150 KHz and extending up to the infrared region.

492 Infrared radiation:
This subclass is indented under subclass 405. Processes wherein the energy applied is considered to have a frequency range with wavelengths longer than those of visible light and shorter than those of radio waves.

(1) Note. Wave energy measured using the electromagnetic spectrum, having a portion which is visible to the eye, lying between wavelengths of 750 nm (0.75 micrometers) and about 1 mm (1000 micrometers) are properly classified here as infrared.

493 Composite work-piece:
This subclass is indented under subclass 492. Processes wherein the infrared radiation is directly applied to a work-piece comprising at least two different, contiguous layers or portions, each having a continuous phase (e.g., plural, adjacent, spacial distinct layers, etc.).

494 Polymerizing, cross-linking, or curing (e.g., utilizing ultraviolet radiation, etc.):
This subclass is indented under subclass 405. Processes wherein the molding material is caused to polymerize, cross-link, or cure.

(1) Note. Properly classified herein are documents claiming the following terms. a. cross-linking b. curing c. addition polymerization d. condensation polymerization e. block or graft polymerization. This list is not intended to be exhaustive and is not limited to the above examples.

495 Indefinite length* articles:
This subclass is indented under subclass 494. Processes wherein the polymerized articles formed are self-sustaining continuous or running length.

496 While contacting a shaping surface (e.g., in mold curing, etc.):
This subclass is indented under subclass 494. Processes wherein the polymerizing, cross-linking, or curing takes place while in a mold or in contact with a molding surface.

497 Using laser sintering of particulate material to build three-dimensional product (e.g., SLS, selective laser sintering, etc.)
This subclass is indented under subclass 405. Processes directed to selective laser induced heat sintering to bond individually randomly associated distinct and deposited particles to form a complete three-dimensional article by building up layers containing a major amount of the particulate material.

(1) Note. The relative sizes of the particles are immaterial, however the particles must retain their discrete nature during the associating and bonding operation. Further, the mere presence of particles in a liquid carrier is not sufficient for this subclass (e.g., fillers or slurries, etc.,) since this is considered to be molding of a fluent or liquid mass rather than the association of particles and is provided for in appropriate subclasses below.

(2) Note. The material is usually, but not necessarily, in the form of fibers or granules and bonding of the particulate material may be effected by applying an adhesive or by the latent adhesive characteristics of the material.

(3) Note. Generally, the subject matter found in this subclass includes dispensing a layer which comprises a plurality of blended or coated powdered materials having different dissociation or bonding temperatures and applying a binder to selected portions of the powdered material, for example by way of an ink-jet print head. The locations that receive the binder are defined according to a cross-section of the part to be produced, communicated to the apparatus by a CAD, computer assisted design, data base. A roller is often used to assist in the proper delivery and alignment of the powdered material. Each powdered layer is selectively sintered by a CAD laser causing layer buildup thereby forming a complete three-dimensional product.

SEE OR SEARCH THIS CLASS, SUBCLASS:

6, for processes of forming solid particulate material by liquid or melt comminuting combined with uniting of said bulk assembled or deposited particles.

109+, for forming articles by uniting randomly associated particles.

131, for a molding process combined with a step of coating with particulate material.

239+, for processes of molding (a) plastic compositions containing particulate material as a filler, (b) colloidal or

non-settling dispersions (e.g., rubber latex, clay, etc.), and (c) plastic particulate material which lose their identity during molding to form a homogeneous product (see (1) Note, above).

517, for processes of applying vacuum or suction to bulk assembled particles.

500 DIRECT APPLICATION OF FLUID PRESSURE DIFFERENTIAL TO PERMANENTLY SHAPE, DISTORT, OR SUSTAIN WORK:

This subclass is indented under the class definition. Processes wherein a positive or negative pressure is applied through the medium of a liquid or gas in direct contact with a workpiece to form or maintain a desired configuration.

(1) Note. The utilization of steam pressure as a source of heat is not included here unless the steam serves to shape, support, or sustain the work. Steam to heat is classified below based on the specific molding or treatment step.

(2) Note. Introduction of fluent material into a mold under pressure is not here unless a gas pressure medium acts directly on the material in the mold cavity. Thus, injection molding utilizing pneumatic pressure to inject the molding material is not here if the pneumatic pressure acts through a column of molding material such as a gate portion of the article. Injection of the molding material rather than directly on the body molding is provided for in subclasses 328+ below.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, subclasses 261+ for glass shaping apparatus comprising inflating a parison in a mold; see the search notes thereunder.

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 387+ for preform reshaping by direct application of gas pressure (e.g., inflating, etc.); see the search notes thereunder.

501 Producing, toroidal work (e.g., tire, etc.):

This subclass is indented under subclass 500. Processes in which the article produced has a toroidal shape.

(1) Note. For a definition of "toroidal" see this class, subclass 315 and accompanying notes.

(2) Note. Toroidal as used in this subclass includes tires, inner tubes, and the like.

SEE OR SEARCH THIS CLASS, SUBCLASS:

315, where the pressure or heat is applied by means of a toroidal inflated bag.

326, for reshaping toroidal shaped work in a closed mold cavity.

502 At least a portion of the external surface being unconfined during application of fluid pressure:

This subclass is indented under subclass 501. Processes in which an exterior portion of the toroidal surface is unconfined during the application of differential fluid pressure.

(1) Note. The processes included herein result in a toroid with an outward projection.

SEE OR SEARCH THIS CLASS, SUBCLASS:

572, for similar processes of shaping partially confined surfaces which are not toroidal.

503 Shaping against interior of a forming surface by rotation of material shaping member:

This subclass is indented under subclass 500. Processes in which rotating motion is imparted to the material being shaped or to the mold or shaping surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8, for formation of particulate material from a liquid or molten mass by means of centrifugal force.

68, for rotation to produce frictional heat.

69+, for processes which pertain to agitating by plural sequential rotations in reverse directions.

114+, for use of centrifugal force in formation of an article by uniting of bulk assembled particles.

175, for processes of forming indefinite length articles by a calendering operation between endless shaping surface, e.g., belts or wheels.
176, for centrifugal spinning of filaments or fibers.
270, for processes of lining a mold cavity employing centrifugal force.
310+, for processes in which rotating motion is imparted to the material shaped or to the mold without the direct application of differential fluid pressure.
556, for a process of casting fluent material onto the exterior of a cooled roll.

SEE OR SEARCH CLASS:
164, Metal Founding, subclasses 114+ for processes of centrifugally casting metals.
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 425+ for a molding machine utilizing mold motion to distribute or compact a fluent material in a mold.

504 Perforation by differential fluid pressure; or smoothing, scoring, or cutting of green concrete with fluid pressure:
This subclass is indented under subclass 500. Processes in which application of fluid pressure results in the formation of a hole or aperture in a workpiece or in which direct application of fluid pressure smooths or cuts a green concrete article.

(1) Note. Excluded herefrom are flash and sprue trimmings by fluid pressure differential and such is provided for in subclass 536.

SEE OR SEARCH THIS CLASS, SUBCLASS:
154, 155 and 156, for hole formation by means other than differential fluid pressure.

505 Corrugating:
This subclass is indented under subclass 500. Processes in which a portion of the workpiece is formed so as to have a cross section having a ternate ridges and grooves.

SEE OR SEARCH THIS CLASS, SUBCLASS:
282, for a process of creping or crinkling without the direct application of differential fluid pressure.
286+, for corrugation of a web without the direct application of differential fluid pressure.

SEE OR SEARCH CLASS:
156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 202+ and subclasses 205+ for corrugating of indefinite length work combined with a laminating operation; and 210 for corrugating and laminating to a noncorrugated lamina.

506 Of a tubular preform:
This subclass is indented under subclass 505. Processes in which the workpiece is hollow, open ended, and of greater axial dimension than diameter.

507 With axial compression:
This subclass is indented under subclass 506. Precesses in which tubular article or preform is corrugated by reduction in its length.

508 Continuous or indefinite length:
This subclass is indented under subclass 506. Processes in which continuous or indefinite length work is corrugated.

509 Labeling or embossing indicia:
This subclass is indented under subclass 500. Processes in which an article or preform (a) is subjected to differential fluid pressure which results in the production of a raised or depressed area in the form of a word or trademark or symbol: or (b) has a label (i.e., preform which is intended to carry printed information which is thin relative to its other dimensions) attached to its surface.

510 Producing multilayer work or article:
This subclass is indented under subclass 500. Processes in which two or more united preforms and/or layers are reshaped or in which a layer is formed on a preform to produce a product with two or more generally contiguous layers or two or more layers are coextruded.

(1) Note. The layers may be of the same or different material so long as there is a difference in some property of the layers.

(2) Note. Uniting shaped sheets to form a hollow article is not considered to make a multilayered product and is provided for in subclass 545.

511 Including application of vacuum to hold, support, or sustain a preform against which material is molded:
This subclass is indented under subclass 510. Processes in which a negative pressure differential is used to hold, support, or sustain a preform to which material is molded or cast.

512 Producing hollow work or a tubular article:
This subclass is indented under subclass 510. Processes in which the article formed is tubular or hollow.

(1) Note. Hollow is intended to comprise cuplike shapes that are relatively deep with respect to diameter.

513 Including injection:
This subclass is indented under subclass 512. Processes in which pressure is applied to the molding material so as to force the material from a source removed from a closed mold cavity into the cavity wherein said material assumes the shape of the interior of said cavity.

514 Including extrusion:
This subclass is indented under subclass 512. Processes in which a supply of material is forced through a confining and shaping orifice.

515 Including forming a hollow article:
This subclass is indented under subclass 514. Processes in which a finite length hollow parison is forced into conformity with a female mold by the application of differential fluid pressure.

516 By insertion or application of a preform:
This subclass is indented under subclass 512. Processes in which a preform is introduced into or applied to the surface of an article or introduced into a fluent material which is formed into an article or preform.

(1) Note. This subclass does not include forming one tubular object from fluent material and then forming another layer thereon.

517 Bulk deposition of particles by differential fluid pressure:
This subclass is indented under subclass 500. Processes directed to bonding to each other individually distinct particles which are associated randomly by bulk handling or deposition to form a layer containing a major amount of the particulate material.

(1) Note. The relative sizes of the particles are immaterial; however, the particles must retain their discrete nature during the associating and bonding operation. Further, the mere presence of particles in a liquid carrier is not sufficient for this subclass (e.g., fillers or slurries), this being considered to be the molding or a fluent or liquid mass rather than the association of particles and is provided for in appropriate subclasses below.

(2) Note. The material is usually but not necessarily in the form of fibers or granules and bonding of the particulate material may be effected by applying an adhesive or by the latent adhesive characteristics of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

109, and the notes thereunder for bulk deposition of particulate nonmetallic material without the application of direct fluid pressure.

SEE OR SEARCH CLASS:

419, Powder Metallurgy Processes, subclasses 39+ for processes for making articles from metal-containing particulate material using pressure and heat wherein the particulate material is formed into a shaped body prior to sintering or heating and a specific pressure or the lack of pressure is recited for the forming step.

518 Continuous or indefinite length:
This subclass is indented under subclass 517. Processes in which a continuous or indefinite length work or product is produced.

519 Differential temperature conditioning:
This subclass is indented under subclass 500. Processs in which different degrees of heating or cooling are positively applied to the workpiece to cause one part to be a higher temperature than another.

(1) Note. To be placed herein, a patent should recite a positively applied temperature differential. Normal heating or cooling to ambient temperatures, for example, wherein an article may be cooled at the surface temporarily more than at the core, is not sufficient to place a patent herein.

(2) Note. This subclass does not include heating for stress relief after forming, such processes will be found with the molding process.

520 Including application of internal fluid pressure to hollow finite length preform to force same into conformity with female mold part:
This subclass is indented under subclass 519. Processes in which a finite length preform is forced into conformity with a female mold.

(1) Note. Finite length parison includes a hollow cylindrical body of plastic which is usually sealed at one end either in its preformed state or as part of the ongoing process. The finite length parison may be a preform or the process herein may include the molding of the parison.

521 Heating:
This subclass is indented under subclass 520. Processes in which the temperature differential is created by at least heating the workpiece.

522 Starting material is nonhollow planar finite length preform or product is planar and of finite length:
This subclass is indented under subclass 519. Processes in which the starting material is a generally planar nonhollow preform or the product is of finite length.

(1) Note. The starting material may be cut off a continuous or running length feed roll.

(2) Note. This subclass provides for processes generally referred to as sheet shaping or thermoforming including a step of differential temperature conditioning.

523 Including application of internal fluid pressure to hollow finite length parison to expand same into conformity with female mold part:
This subclass is indented under subclass 500. Processes in which a finite length hollow parison is expanded into conformity with a female mold by the application of a differential fluid pressure.

(1) Note. A parison in general is a hollow cylindrical preform of relatively smaller diameter than length which may be sealed or open and of an overall size suitable for blow molding.

(2) Note. Excluded from this subclass are processes which deform a flat sheet by forcing it into a female mold, such is provided for in subclasses 544+.

524 Production of a sealed product or a filled mercantile container:
This subclass is indented under subclass 523. Processes in which the product of the process is a completely sealed article or in which the article is filled with a fluid and sealed.

(1) Note. Included herein are balls, incomplete containers, i.e., without filling openings and filled containers.

SEE OR SEARCH CLASS:

426, Food or Edible Material: Processes, Compositions, and Products, for forming a container by differential fluid pressure wherein the fluid is claimed as an edible within that class definition.

525 Including maintenance or production of internal sterility:

This subclass is indented under subclass 524. Processes in which molding is carried out in such a manner as to produce an internally sterile article or to maintain a sterile condition in a preform being treated.

526 Including use of vacuum or internal venting of parison to remove fluid after application of differential fluid pressure:

This subclass is indented under subclass 523. Processes in which the parison is vented internally to remove a blowing fluid or a vacuum applied to created differential fluid pressure.

527 Forming multiple containers in a single mold block from a single length of parison:

This subclass is indented under subclass 523. Processes in which two or more containers are formed from a single finite length parison in a single or sequential operation in a single mold block.

(1) Note. This subclass does not include continuous clamshell molds that act on an indefinite length hollow tube.

(2) Note. Mold block, as used herein, includes a single shape defining means which defines one or more hollow articles.

528 Including internal cooling of the article after fluid pressure shaping:

This subclass is indented under subclass 523. Processes in which a fluid cooling medium is introduced into the molded work or article.

(1) Note. This subclass does not include the use of an internal mold part or accessory, for example, a cooled mandrel to effect internal cooling.

529 Including plural distinct steps of differential fluid pressure induced expansion:

This subclass is indented under subclass 523. Processes in which expansion by differential fluid pressure of the parison takes place in two or more sequential steps each of which causes deformation.

(1) Note. One of the steps of expansion may be prepuffing or free expanding of the workpiece.

(2) Note. The two or more expansion steps may take place in the same or different molds, or one expansion step may be carried outside the mold, i.e., free blowing followed by blow molding, etc.

530 In diverse female mold cavities:

This subclass is indented under subclass 529. Processes in which the sequential expansion steps take place in each of two or more molds.

531 Including shaping by mechanical means other than fluid pressure during or subsequent to fluid pressure differential shaping:

This subclass is indented under subclass 523. Processes in which sequential reshaping is carried out by physical contact with relatively moving forming means.

(1) Note. Severing, bottom pinching and neck molding wherein the neck is molded as an inherent step in the closing of the mold about the parison or workpiece are not considered reshaping within the meaning of this subclass; however, if a separate neck mold is closed about the neck portion or a mandrel is inserted forcing material into a neck mold portion of a closed mold this would be sufficient to be considered reshaping for purposes of this subclass.

532 Shaping is longitudinal or axial stretching prior to or during differential fluid pressure deformation:

This subclass is indented under subclass 531. Processes in which, by application of physical force by a machine part, the greatest dimension of a parison or workpiece is increased.

(1) Note. The mechanical stretching may be accompanied by increased fluid pressure differential.

(2) Note. The mechanical stretching may be accomplished by internal or external contact.

(3) Note. Punching of holes in a container absent other significant deformation is not included herein. Hole formation by differential fluid pressure is provided for in subclass 504.

533 Shaping is neck formation other than by closure of mold for body of article:
This subclass is indented under subclass 531. Processes in which the neck of a container is reshaped by application of mechanical force other than the closing of the mold for the body of the container.

(1) Note. This subclass includes neck calibration when it takes place as a step separate from the closing of the mold.

534 Shaping is subsequent to expansion:
This subclass is indented under subclass 531. Processes in which the mechanical reshaping takes place after an expansion by differential fluid pressure.

(1) Note. Included herein are, for example, processes for giving a container a concave bottom by deformation of a flat or convex bottom.

535 Including heating of previously formed parison to blow molding temperature:
This subclass is indented under subclass 523. Processes in which the cool preformed parison is reheated to a temperature where it may be shaped by differential fluid pressure.

536 Including removal of flash or sprue:
This subclass is indented under subclass 523. Processes in which subsequent to deformation caused by differential fluid pressure flash or sprue is removed or part of the molded article is cutaway to form an aperture or two articles are separated by severing.

(1) Note. The severing or removal of flash or sprue may be by the application of differential fluid pressure.

537 Including injection forming of parison or portion thereof:
This subclass is indented under subclass 523. Processes in which the parison has at least a portion thereof formed by application of pressure which forces material into a closed mold cavity under pressure.

538 Arcuate or rotary movement of parison or workpiece from one work station to another:
This subclass is indented under subclass 537. Processes in which the parison or workpiece is caused to move in a manner so as to describe or approximate the arc of a circle from one work station to another.

(1) Note. A workpiece is parison which has been worked on in some manner, e.g., blown, sealed, etc.

539 Including extrusion:
This subclass is indented under subclass 537. Processes in which material is shaped to the cross section of an orifice by forcing it through the confining orifice.

540 Including extrusion:
This subclass is indented under subclass 523. Processes in which material is shaped to the cross section of an orifice by forcing it through the confining orifice.

541 Of irregular or varying cross section:
This subclass is indented under subclass 540. Processes in which the formed article is of non-uniform cross section throughout its length, or a portion thereof, which may result from a gradual change in transverse dimension or through intermittent or repeated separated irregularities therein.

542 With movement of parison or workpiece from one work station to another:
This subclass is indented under subclass 540. Processes in which the parisoner workpiece is moved from one work station to another.

(1) Note. This includes moving the mold containing the parison from one place to another, e.g., chain mold, etc.

543 Movement is arcuate or rotary:
This subclass is indented under subclass 542. Processes in which the workpiece is caused to move in a manner so as to describe or approximate the arc of a circle from one work station to another.

544 Starting material is nonhollow planar finite length preform or product is finite length:
This subclass is indented under subclass 500. Processes in which the starting material is a generally planar nonhollow preform or the product of the process is a finite length sheet.

(1) Note. The starting material may be cut off a continuous or running length feed roll.

(2) Note. This subclass provides for what is generally termed sheet shaping.

545 Including uniting plural shaped sheets to form hollow work:
This subclass is indented under subclass 544. Processes in which two or more sheets are combined and shaped to form a hollow article.

546 Material shaped is a fabric, per se:
This subclass is indented under subclass 544. Processes in which the material shaped is solely a woven or nonwoven fabric.

(1) Note. This does not include shaping of fabrics which are a reinforcing layer in a laminate but will include the temporary uniting of a fabric with a fluid impervious layer for purposes of shaping.

547 With distinct staged deformation by differential fluid pressure:
This subclass is indented under subclass 544. Processes in which the differential fluid pressure is applied in sequential noncontinuous increments.

(1) Note. This subclass includes processes in which a sheet is forced in one direction and then the opposite direction by application of differential fluid pressure.

(2) Note. A step of curing or vulcanization is not for purposes of this subclass a shaping step.

548 Including heating after forcing into contact with a solid heating means by differential fluid pressure:
This subclass is indented under subclass 547. Processes in which the workpiece is by application of differential fluid pressure, forced into contact with a heated surface before further shaping.

549 Including use of male part to stretch heated preform which is formed by a female mold which determines shape of work:
This subclass is indented under subclass 547. Processes in which a member contacts and deforms or stretches a sheet of material in an axial direction before the application of differential fluid pressure to force it into conformity with a female mold which determines the shape of the workpiece.

550 Including use of male part to stretch heated preform which is formed by a female mold which determines shape of work:
This subclass is indented under subclass 544. Processes in which a member contacts and deforms or stretches a sheet of material in an axial direction before the application of differential fluid pressure to force it into conformity with a female mold which determines the shape of the workpiece.

551 Simultaneous formation of plural articles:
This subclass is indented under subclass 550. Processes in which a plurality of deforming members act to deform or stretch a plurality of sheets or a number of locations on a single sheet.

552 Including curing or vulcanization:
This subclass is indented under subclass 544. Processes in which a thermosetting plastic is cured or rubber is vulcanized.

553 Including use of vacuum:
This subclass is indented under subclass 544. Processes in which the work is subjected to a pressure less than atmospheric.

SEE OR SEARCH THIS CLASS, SUBCLASS:

87, for processes of removing a liquid through a mold surface by vacuum.

101+, for processes of treating work by use of a vacuum which treatment does not support, shape, or sustain the work.

554 Including use of male mold part which determines the final shape of at least a portion of the work:

This subclass is indented under subclass 553. Processes in which the work is shaped about a mold part, i.e., male mold member.

555 Production of continuous or running length:

This subclass is indented under subclass 500. Processes in which a continuous or running length product is produced.

(1) Note. In this and the indented subclass mechanical treatment of a continuous or running length tube as by cutting off or slitting will not defeat placement herein.

556 By casting on to a cooled roll:

This subclass is indented under subclass 555. Processes in which the indefinite length article is formed by depositing fluent material on a cylindrical rotating surface and solidifying the fluent material.

(1) Note. See subclass 212 and the notes thereunder for related fields of search.

557 Including liquid contact:

This subclass is indented under subclass 555. Processes in which the work is contacted with liquid.

558 Including internal liquid contact:

This subclass is indented under subclass 557. Processes which include contacting the internal surface of the continuous or running length with liquid.

559 With downward movement of workpiece:

This subclass is indented under subclass 558. Processes in which the workpiece is caused to travel in a downward direction in or into a liquid bath after an initial forming step or the workpiece is caused to travel in a downward direction into annular liquid contact after an initial forming step.

(1) Note. The initial forming step is typically the extrusion of the tubular workpiece.

560 With calibration, mandrel forming or with internal guide:

This subclass is indented under subclass 557. Processes in which a sizing operation follows the initial forming operation or forming takes place with the use of an internal forming or supporting member.

561 Contact with liquid coagulant or reactive liquid:

This subclass is indented under subclass 557. Processes in which a fluent or solid material is contacted with a liquid which causes a chemical reaction to take place.

(1) Note. A plasticizer in the absence of a clear showing to the contrary is presumed to be nonreactive.

562 With immersion in liquid bath:

This subclass is indented under subclass 557. Processes in which the continuous or running length is submerged in a pool of liquid.

(1) Note. Included herein are annular baths.

563 Producing a tubular product:

This subclass is indented under subclass 555. Processes in which the continuous or running length product formed is hollow.

(1) Note. This subclass provides for supporting or sustaining a tubular article.

564 Including deformation by application of fluid pressure:

This subclass is indented under subclass 563. Processes in which the tubular product is shaped or deformed by the application of differential fluid pressure.

565 With internal gas bearing or mandrel:

This subclass is indented under subclass 564. Processes in which the tubular product is internally shaped or supported by an internal solid member or by gas issuing from a solid internal member.

566 With application of external pressure or vacuum:
This subclass is indented under subclass 564. Processes in which the tubular product is shaped by the application of a positive or negative differential pressure to its exterior surface.

(1) Note. This subclass includes application of positive physical pressure by means of a mechanical device in contact with the work.

567 With reheating of work (e.g., tempering, annealing, etc.):
This subclass is indented under subclass 566. Processes in which a hollow article is reheated before the application of differential fluid pressure.

(1) Note. This subclass includes tempering or annealing of a hollow continuous or running length article before blowing.

568 Including use of vacuum:
This subclass is indented under subclass 566. Processes in which the work is subjected to a pressure less than atmospheric.

(1) Note. Vacuum as used in this subclass does not include blowing air across the surface of a tubular product and thus producing a negative pressure by a venturi effect.

569 Including annular fluid contact:
This subclass is indented under subclass 566. Processes in which fluid is applied externally in a band around the circumference of a tubular product which band is of much shorter length than the tubular article.

570 Including hydrostatic or liquid pressure:
This subclass is indented under subclass 500. Processes in which differential fluid pressure is applied to work by a liquid.

(1) Note. This subclass includes hydrostatic extrusion.

571 Including use of vacuum:
This subclass is indented under subclass 500. Processes in which the work is subjected to a pressure less than atmospheric.

572 With internal application of fluid pressure:
This subclass is indented under subclass 500. Processes in which fluid pressure is applied to the interior of hollow work or a hollow article.

573 To finite length tubular product:
This subclass is indented under subclass 572. Processes in which the hollow work or article is cylindrical and of finite length.

574 To form generally spherical product:
This subclass is indented under subclass 572. Processes in which the hollow work or article is generally spherical.

600 HEAT POLISHING (E.G., GLAZING, ETC.) OF INORGANIC ARTICLE SURFACE OUTSIDE OF MOLD:
This subclass is indented under the class definition. Processes for producing inorganic article by firing outside of the mold at temperatures sufficiently high to cause only a surface of the article to become melt smoothed or melt rounded without substantial loss of original self-sustaining shape of the overall article.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15, for processes of spheroidizing or rounding solid particle.
129, Note (1), for a discussion of shaping and coating combinations.
332, for fusing or melting inorganic materials, per se, in a mold or employing a mold.
609, for particular or specific manner of positioning, arranging, or conveying of plural blocks, tiles, or bricks (e.g., stacking, utilizing spacer, etc.) during sintering, vitrifying, or drying.
680, for process of otherwise shaping or treating block, tile, or brick combined with sintering, vitrifying, or firing outside the mold.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, appropriate subclasses for processes under the class definition which include glass fusing or vitrifying.
427, Coating Processes, for processes including the combination of (a) firing and coating, or (b) nominal molding,

significant coating, and firing; regardless of the sequence of the respective steps. However, combinations of (a) significant molding, firing, and coating, or (b) nominal molding and nominal coating are classified in Class 264; regardless of the sequence of the respective steps.

601 Of clay containing block, tile, or brick:

This subclass is indented under subclass 600. Process wherein articles or preforms undergoing treatment are, often hand-sized, usually rectangular or square, building blocks of material containing clay (i.e., an earthy material that is composed of hydrous aluminum silicates and other materials that are plastic when moist and hard when fired) identified as a block, tile, or brick.

(1) Note. Lacking an indication to the contrary, the mere use of block, tile, or brick without indicated composition will be considered proper for this subclass, even if not disclosed to contain clay.

SEE OR SEARCH THIS CLASS, SUBCLASS:

609, for particular or specific manner of positioning, arranging, or conveying of plural blocks, tiles, or bricks (e.g., stacking, utilizing spacer, etc.) during sintering, vitrifying, or drying.

644, for process of shaping or treating multilayered or composite block, tile, or brick combined with sintering, vitrifying, or firing outside the mold.

602 With coating outside of mold:

This subclass is indented under subclass 600. Process wherein there is a combination of significant shaping and coating of the shaped preform outside of the mold.

SEE OR SEARCH THIS CLASS, SUBCLASS:

129, Note (1), for a discussion of shaping and coating combinations.

SEE OR SEARCH CLASS:

427, Coating Processes, for processes including the combination of (a) firing and coating, or (b) nominal molding, significant coating, and firing; regardless of the sequence of the respective steps. However, combinations of (a) significant molding, firing, and coating, or (b) nominal molding and nominal coating are classified in Class 264; regardless of the sequence of the respective steps.

(1) Note. When sintering or firing of a coated or impregnated fibrous shaped material results in decomposition of the fibrous material and production of a noncoated or nonimpregnated shaped product, the process will be considered proper for Class 264.

603 OUTSIDE OF MOLD SINTERING OR VITRIFYING OF SHAPED INORGANIC ARTICLE OR PREFORM:

This subclass is indented under the class definition. Processes for producing or treating inorganic shaped articles in which a self-sustaining shaped article or preform comprising inorganic materials or precursors thereof are fired outside of the mold at temperatures sufficiently high to cause said article or preform to become sintered or vitrified without substantial loss of original self-sustaining shape due to sagging or gravity.

(1) Note. Vitrification is a densification of inorganic ceramic material that results from firing at sufficient temperature to produce a progressive fusion of particles through the assistance of a viscous liquid silaceous-like bonding phase into a body having dense glass-like characteristics (e.g., hardness, brittleness, smoothness, etc.). As vitrification progresses, the proportion of glassy-like bond formed increases and apparent porosity of the substance decreases without appreciable slumping or sagging. Sintering is the coalescence of parts through solid state diffusion into a densified solid mass through heating, generally with fusion limited to only surface layer of each particle, such that some particulate identity remains. The partial melting or vitrification of inorganic materials in the mold is provided for in various subclasses below, such as subclasses 109+ or 332+.

(2) Note. The terms baking, burning, calcining, or firing recited in a patent is considered to read on either sintering or vitrifying and is included herein, unless disclosed as being for some other purpose or at a clearly too low or inadequate temperature to accomplish sintering or vitrifying. Baking, burning, calcining, or firing outside the mold of shaped articles to decompose binder or organometallic precursors is included hereinunder if other criteria of this subclass definition are met. However, baking, burning, calcining, or firing, (a) to render a mass friable, (b) at a temperature only sufficient to drive out the moisture content, or (c) to volatilize organic material without decomposition would be excluded from subclasses 603+.

(3) Note. Articles formed by accretion from bulk having embedded therein a form to be removed during or after firing are considered to be self-sustaining bodies for the purpose of this subclass.

(4) Note. Hot isostatic pressing (i.e., HIP) relates to application of an equalized fluid pressure to all external sides or surfaces of an article. This is usually performed outside of a mold in a gaseous atmosphere at substantially elevated temperatures and pressures. Lacking an indication to the contrary, hot isostatic pressing per se of an article or preform will therefore be assumed to occur outside of a mold at a temperature sufficiently high to be proper for this subclass. Shaping by applying hot isostatic fluid pressure to a preform using surrounding liquid (e.g., molten glass coating, melted tin, etc.) or fluid pressure-transmitting deformable sheath (e.g., metal foil, etc.) will be considered to be outside a mold for purposes of this subclass. However, so-called "pseudoisostatic pressing" with loose particulate between solid pressing surfaces and preform will not be considered proper for this subclass.

(5) Note. See Lines With Other Classes, "Lines With the Chemical Classes" (8) of the class definition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

0.5+, for shaping or treating of radioactive materials (e.g., sintering uranium oxide rods, etc.).

15, for processes of spheroidizing or rounding of solid particles.

16+, for shaping ceramic dental type articles.

29.1+, for processes which include a step of carbonizing by a firing operation which produces a product containing elemental carbon therein.

30, for processes of furnace lining or repair which may include a firing operation.

43+, for processes of forming pores in inorganic materials during vitrification or firing.

125+, for sintering or heat fusion of particles to autogenously bond while in a mold (e.g., hipping, etc.)

234+, for applied temperature change out of mold.

332, for fusing or melting inorganic materials, per se, in a mold or employing a mold and see (5) Note above.

333+, for shaping inorganic settable hydraulic compositions under heat or pressure and see (5) Note above.

345+, for treating shaped or solid articles by a temperature change.

405+, for processes of firing, sintering, or vitrifying wherein wave energy or electric current is involved.

SEE OR SEARCH CLASS:

65, Glass Manufacturing, appropriate subclasses for processes under the class definition which include glass fusing or vitrifying. A process directed to (a) heating a material within the scope of Class 65 to the molten state and forming a shaped preform therefrom, or (b) bulk depositing glass fibers into a mold surface and thereafter fusing the fibers to each other is classified in Class 65. See the definitions of Class 65, section III B,

with particular reference to the line with this class 264 for processes. See also the search notes to Class 65, subclasses 17.3, 376, and 454; and see the class definitions in this class 264 for further delineation of the line with Class 65.

(1) Note. With regard to glass particle uniting, a recitation of placing of glass particles (i.e., other than glass fibers or mineral wool) in their final position in a mold, followed by autogenous uniting or sintering outside the mold in the configuration or shape imparted by said mold, will be classified in this Class 264; whether or not said particles are disclosed to maintain their individual identities to any degree. Class 264 takes processes directed to (a) shaping a mass of green siliceous material and subsequently firing or curing the material to set the material or (b) placing discrete siliceous particles (i.e., other than glass fibers or mineral wool) onto a mold surface which particles are heated on or subsequent to contact with the surface to fuse the particles to each other.

(2) Note. Using a glass in a molten state as a fluid pressure transmitting media in hot isostatic pressing of shaped articles is acceptable in Class 264, if the glass is subsequently removed and is not part of the final pressed product.

75, Specialized Metallurgical Processes, Compositions For Use Therein, Consolidated Metal Powder Compositions etc., particularly subclasses 751+ for processes of heat treating (e.g., calcinating, fusing, indurating, roasting, sintering, vaporizing, etc.) to preparing consolidated shaped metalliferous charges (e.g., ore, tailings, flue dust, fluxes, etc.) or metalliferous treating agents amenable to Class 75 or Class 420 refining or alloying operation.

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclasses 89.11+ for vitrification or firing of a ceramic material when combined with a laminating step joining preforms.

419, Powder Metallurgy Processes, subclasses 10+ for processes of making articles from particulate material containing a metal and nonmetal involving pressure and heat (e.g., sintering, etc.).

(1) Note. Combined operations involving sintering particulate metal and particulate ceramic is proper for Class 419.

(2) Note. If, after Class 419 consolidation of metal particles, subsequent processing eliminates completely all free metal from the consolidated shaped particulate free metal by total conversion thereof to a metal compound or composition (e.g., metal oxide, metal nitride, etc.) as a result of firing or sintering outside of the mold under reactive conditions, placement is to be considered proper in this section of Class 264.

427, Coating Processes, for processes including the combination of (a) firing and coating, or (b) nominal molding, significant coating, and firing; regardless of the sequence of the respective steps. However, combinations of (a) significant molding, firing, and coating, or (b) nominal shaping and nominal coating are classified in Class 264; regardless of the sequence of the respective steps. See this class subclass 129, Note (1), for a discussion of shaping and coating combinations.

(1) Note. When sintering or firing of a coated or impregnated fibrous material results in decomposition of the fibrous material which acts as a shaping surface and production of a noncoated or nonimpregnated shaped product, the process will be considered proper for Class 264.

432, Heating, subclass 6 for a residual heating process including a step of stacking or aligning the objects to be heated and subclasses 258+ for means for supporting ceramic work during heating; (i.e., kiln furniture).

501, Compositions: Ceramic, appropriate subclass for ceramic compositions, per se, and processes of preparing such compositions.

(1) Note. When nominal molding of a Class 501 composition is involved, placement in Class 501 is proper if limited to the conditions set forth in any one of the following situations: (a) No conditions are specified. (b) Firing for a specified time at a specified temperature (e.g., firing for 10 minutes at 1000°F, etc.). (c) Blending or mixing of ingredients of said composition during or prior to the molding step and a chemical reaction present.

(2) Note. When molding of a Class 501 composition is involved, Class 264 is proper if any one of the following situations are present: (a) Significant molding. (b) Nominal molding and specifying firing or sintering temperature without specifying time of heating. (c) Nominal molding and raising to specified temperature in a specified time (e.g., raising to 1000° F in 10 minutes, etc.). (d) Nominal molding and plural heating steps during or after molding (e.g., ramping in stages, etc.). (e) Nominal molding, firing and controlled cooling. (f) Nominal molding and specifying pressure. (g) Nominal molding and blending or mixing ceramic with a temporary binder and firing which decomposes the binder.

(3) Note. When there is any doubt concerning placement between Class 501 and Class 264 concerning nominal molding, resulting from variations <u>not</u> addressed by the above notes (1) or (2), original placement will go to Class 264 with a mandatory cross-reference to Class 501.

(4) Note. When there is (a) a process claim present that is proper for Class 264 and (b) a product claim classifiable as Class 501 composition expressed in terms of starting material, placement of original goes to Class 264. However, when there is (a) a process claim present that is proper for Class 264 and (b) a product claim classifiable as a Class 501 composition expressed in terms of a final processed state (e.g., “sintered” composition, etc.), placement of original goes to Class 501.

588, Hazardous or Toxic Waste Destruction or Containment, subclasses 252+ for the use of vitrification in the treatment of hazardous or toxic waste for purposes of containment.

604 Applying hot isostatic fluid pressure to preform using surrounding liquid (e.g., molten glass, melted tin, etc.) or fluid pressure-transmitting deformable sheath (e.g., metal foil, etc.):

This subclass is indented under subclass 603. Process wherein the shaped article or preform is subjected to (a) hot isostatic pressing by uniformly applying fluid pressure thereto through a encompassing liquid (e.g., molten glass, melted tin, etc.), or (b) hot isostatic fluid pressing through an encompassing transitory plastic or deformable sheath which transmits the compressing force isostatically to consolidate the preform without the direct contact of the fluid.

(1) Note. Since particulate material is not an article or preform, consolidating of loose particulate by fluid pressure while encased in a transitory plastic or deformable sheath will be considered a molding step classifiable elsewhere in this class, such as in subclasses 500+.

605 Particular or specific manner of positioning, arranging, or conveying of <u>plural</u> articles or <u>plural</u> preforms (e.g., stacking, utilizing

spacer, etc.) during sintering, vitrifying, or drying:
This subclass is indented under subclass 603. Processes wherein multiple articles or preforms are placed or aligned in a particular manner or are in a particular motion other than mere conveying during sintering, vitrifying, or drying.

SEE OR SEARCH THIS CLASS, SUBCLASS:
671, for particular or specific manner of positioning, arranging or conveying of single article or single preform during firing (e.g., utilizing spacer, etc.)

SEE OR SEARCH CLASS:
414, Material or Article Handling, subclass 789 for processes of arranging articles, per se, for sintering.

606 In a tunnel or channel kiln:
This subclass is indented under subclass 605. Processes wherein an elongated essentially horizontal furnace is utilized.

SEE OR SEARCH THIS CLASS, SUBCLASS:
652, for sintering or vitrifying of a single article or preform in tunnel or channel kiln.

607 Utilizing removable setter or spacing means:
This subclass is indented under subclass 605. Process wherein a temporary support is utilized for holding plural articles or plural preforms within a furnace or heating means during heat treatment.

608 Utilizing spacing means between stacked articles while heating outside of mold:
This subclass is indented under subclass 607. Process wherein, during a heating step outside a mold, two or more articles are arranged one above the other with an intervening separating means therebetween.

609 Of clay containing block, tile, or brick:
This subclass is indented under subclass 605. Process wherein articles or preforms undergoing treatment are hand-sized, usually rectangular, or square building block of material containing clay (i.e., an earthy material that is composed of hydrous aluminum silicates and other materials that are plastic when moist and hard when fired) identified as a block, tile, or brick.

(1) Note. Lacking an indication to the contrary, the mere use of block, tile, or brick will be considered proper for this subclass, whether or not disclosed to contain clay.

SEE OR SEARCH THIS CLASS, SUBCLASS:
601, for heat polishing or glazing of clay containing block, tile, or brick.
644, for process of shaping or treating multilayered or composite block, tile, or brick combined with sintering, vitrifying, or firing outside the mold.
680, for process of otherwise shaping or treating block, tile, or brick combined with sintering, vitrifying, or firing outside the mold.

610 Simultaneously burning, vaporizing, or melting of embedded element or core to form nonrandom void:
This subclass is indented under subclass 603. Process wherein a specifically located embedded shaping element or core is concurrently decomposed or liquified to provide a nonrandom empty region or hole in an article or preform during sintering or vitrifying of an article or preform.

SEE OR SEARCH THIS CLASS, SUBCLASS:
41+, for in situ processes of internally forming pores or voids in an article or material by occluding or incorporating void forming or void producing elements or ingredients randomly throughout the plastic forming material.

(1) Note. A binder will not be considered a void forming or void producing element or ingredient.

611 Of magnetic (e.g., ferrite, etc.) article or component:
This subclass is indented under subclass 603. Process wherein the article or preform undergoing shaping or treatment contains a magnetic material.

612 Using organic binder or organometallic:
This subclass is indented under subclass 611. Process wherein the magnetic article or preform undergoing shaping or treatment includes either (a) an organic material that serves to hold material together in a temporary or green shape, or (b) a compound of metal and an organic material as a transitional precursor to the final product.

(1) Note. Normally, organic or organometallic compounds will decompose before fusing or sintering occurs. Thus, the mere indication of decomposition thereof will not make placement proper under 603, unless the other criteria for Class 264 sintering, vitrifying, or partial fusion is present.

613 Specifying atmosphere other than air (e.g., oxidizing, inert, 10% Oxygen, etc.):
This subclass is indented under subclass 611. Process wherein the composition or chemical characteristic of the gaseous environment is identified and is not air.

614 Of electrical article or electrical component (i.e., not insulator, per se):
This subclass is indented under subclass 603. Process wherein the article or preform undergoing shaping or treatment is an electrical device or an electrical component utilized for conducting or controlling electrical current as part of an electrical device.

(1) Note. An electrical insulator, per se, will not be considered proper for this subclass.

615 Capacitor (e.g., condenser, etc.):
This subclass is indented under subclass 614. Process wherein the electrical article or component produced is a device consisting of two conducting surfaces separated by an insulating material (e.g., air, glass, etc.) and which device is used to store electrical energy or to release stored electrical energy dependent upon the potential difference between the separated conducting surfaces, thus producing a discharge therebetween to temporarily complete a circuit.

616 Resistor:
This subclass is indented under subclass 614. Process wherein the electrical article or component produced is made of a material that has a specified opposition to the flow of electrical current and is intended to be used to control the amount of electrical current in a circuit.

617 Varistor:
This subclass is indented under subclass 616. Process wherein the resistor varies in resistance depending on the amount of electrical current flowing through a circuit.

618 Ceramic containing electrode, or coil; electrode, or coil having ceramic portion; or shaped electrolyte body:
This subclass is indented under subclass 614. Process wherein the electrical article or component produced is an electrode or coil having at least part of the electrode structure adjacent to or composed of ceramic material or shaped solid electrolyte.

619 Having patterned metal electrical conductor other than electrode (e.g., printed circuit, etc.):
This subclass is indented under subclass 614. Process wherein the electrical article or component produced includes a configured electrically conductive metal element or connection, other than an electrode, that is embedded within or applied thereon.

620 Having plural heating steps:
This subclass is indented under subclass 614. Process wherein the process of producing the electrical article or component has multiple heating steps.

621 Utilizing sol or gel:
This subclass is indented under subclass 603. Process wherein either (a) a liquid colloidal suspension, or (b) a colloid in which the disperse phase has combined with the continuous phase to produce a viscous, jelly-like material, is utilized at any stage.

622 Unconfined drawing or extending of plastic mass to form article:

This subclass is indented under subclass 621. Process wherein the article is formed by the free and unconfined pulling out of a plastic mass.

(1) Note. The surface configuration of the article formed is imparted solely by the extension and not by coaction of the plastic mass with a shape imparting mold surface.

(2) Note. Kneading or mulling operations, per se, (e.g., taffy pulling type, etc.) are not included herein since a shaped article is not produced. See subclass 349 and the notes thereto for such subject matter.

SEE OR SEARCH THIS CLASS, SUBCLASS:

164+, for nonsintering process of unconfined drawing or extending of a plastic mass to make an article.

165+, for process of forming indefinite length work by other than unconfined extension of a plastic mass.

288.4, and 291+, for processes relating to stretching, per se, of a previously shaped article.

349, for kneading or mulling operations and see (2) Note above.

623 Shaping by extrusion (e.g., spinning, etc.):

This subclass is indented under subclass 621. Process wherein an article is formed by forcing a supply of article forming material through a confining and shaping orifice.

SEE OR SEARCH THIS CLASS, SUBCLASS:

176.1+, for processes of shaping by extrusion that do not involve sintering of the formed article outside of a mold.

634, for shaping by extrusion of nonsol or nongel materials followed by sintering outside the mold.

SEE OR SEARCH CLASS:

425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 376.1+ for an extrusion shaping machine for nonmetals; see the search notes thereunder.

624 Using organometallic or organosilicon intermediate:

This subclass is indented under subclass 603. Process in which a compound of metal and an organic material, or silicon and an organic material is the transitional precursor to the final shaped product.

(1) Note. Normally, organometallic or organosilicon compounds will decompose before fusing or sintering occurs. Thus, the mere indication of decomposition thereof will not make placement proper under 603, unless the other criteria of Class 264 sintering, vitrifying, or partial fusion is present.

625 Forming carbide or carbonitride containing product:

This subclass is indented under subclass 624. Process wherein a product containing a binary compound of carbon and metal or silicon (e.g., metal carbide, silicon carbide, etc.) or tertiary compound of carbon, nitrogen, and metal or silicon (e.g., metal carbonitride, silicon carbonitride, iron nitrocarbide, etc.) is produced.

626 Forming nitride or oxynitride containing product:

This subclass is indented under subclass 624. Process wherein a product containing a binary compound of nitrogen and metal or silicon (e.g., metal nitride, silicon nitride, etc.) or tertiary compound of nitrogen, oxygen, and metal or silicon (e.g., metal oxynitride, silicon oxynitride, etc.) is produced.

627 Forming fiber:

This subclass is indented under subclass 624. Process wherein a relatively small, slender discrete mass having length considerably greater than its breadth (i.e., cross-sectional diameter) is produced.

628 Producing microporous article (e.g., filter, etc.):

This subclass is indented under subclass 603. Process for treating an article expressed or claimed as having small open or interconnected randomly distributed microvoids or producing an article expressed or claimed as having small open or interconnected randomly distributed microvoids by uniting particulate material.

(1) Note. Impregnating a porous preform (e.g., sponge, etc.) with inorganic material followed by sintering outside of the mold to cause formation of a porous inorganic body while decomposing the preform which acts as a shaping surface is proper under this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41+, for in situ processes of internally forming pores or voids in an article or material by intentionally occluding or incorporating void forming or void producing elements or ingredients randomly throughout the plastic forming material.

(1) Note. Thus, incorporating particulate organic material in an inorganic forming material with subsequent burning decomposition of the particulate organic material to form random pores in an inorganic product would be proper under subclass 44, hereinabove.

317, for processes generally which involves the destruction of material which may leave a space or void.

321, for processes of reshaping previously foamed material.

629 Producing article having plural hollow channels:

This subclass is indented under subclass 603. Process wherein the article produced has plural hollow macrostructural channels.

SEE OR SEARCH THIS CLASS, SUBCLASS:

610, for simultaneously burning, vaporizing, or melting of embedded element or core to form nonrandom void.

630 Producing honeycomb shape:

This subclass is indented under subclass 629. Process wherein the article produced has a continuous parallel orderly series of open or empty, usually hexagonal, interconnected macrostructural cells which resemble a natural honeycomb.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41, for in situ processes of internally forming pores or voids in an article or material by occluding or incorporating void forming or void producing elements or ingredients randomly throughout the plastic forming material.

631 From cordierite (i.e., $2MgO.2Al_2O_3.5SiO_2$, iolite):

This subclass is indented under subclass 630. Process wherein the honeycomb structure is produced from cordierite (i.e., $2MgO.2Al_2O_3.5SiO_2$, iolite).

632 Producing hollow article (e.g., tube, etc.):

This subclass is indented under subclass 603. Process wherein the article produced has an empty indention or inward curve (e.g., tube, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:

610, for simultaneously burning, vaporizing, or melting of embedded element or core to form nonrandom void.

633 Producing bowl-like article:

This subclass is indented under subclass 632. Process wherein a hollow concave nontubular, bowl-like article (e.g., hemispherical, etc.) is produced.

634 Shaping by Extrusion (e.g., spinning, etc.):
This subclass is indented under subclass 632. Process wherein an article is formed by forcing a supply of article forming material through a confining and shaping orifice.

SEE OR SEARCH THIS CLASS, SUBCLASS:
638, for shaping nonhollow bodies by extrusion (e.g., spinning, etc.).

635 Utilizing core mandrel:
This subclass is indented under subclass 632. Process wherein a shaping means serves as a center around which material is formed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
610, for processes of simultaneously burning, vaporizing, or melting of embedded core to form a nonrandom void.

636 Casting suspension of particles against forming surface:
This subclass is indented under subclass 632. Process wherein a dispersion of particles in a liquid vehicle are placed in or on a shaping surface and the liquid vehicle removed to produce a shaped article or preform.

637 Removal of liquid component or carrier through porous or absorbent mold surface:
This subclass is indented under subclass 636. Process wherein a liquid component or liquid vehicle for a moldable material is removed or separated from the material through a foamlike or absorbent shaping surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
651, for removal of liquid component or carrier through porous or absorbent mold surface (e.g., slip casting, etc.) to form nonhollow articles.

638 Shaping by extrusion (e.g., spinning, etc.):
This subclass is indented under subclass 603. Process wherein an article is formed by forcing a supply of article forming material through a confining and shaping orifice.

SEE OR SEARCH THIS CLASS, SUBCLASS:
176.1+, for processes of shaping by extrusion that do not involve sintering of the formed article outside of a mold.

SEE OR SEARCH CLASS:
425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclasses 376.1+ for an extrusion shaping machine for nonmetals; see the search notes thereunder.

639 Of indefinite length product (e.g., sheet, tape, rod, fiber, etc.):
This subclass is indented under subclass 638. Process wherein a continuous, running or indefinite length body is formed by an uninterrupted molding step.

(1) Note. The final article produced need not be of indefinite length, as for example, wherein the continuous, running or indefinite length body is cut into predetermined length pieces.

(2) Note. Extrusion is generally assumed to produce an indefinite length product unless otherwise indicated.

640 Producing fiber containing article or fiber:
This subclass is indented under subclass 603. Process wherein (a) an article is formed which contains a relatively small slender discrete mass having length considerably greater than its breadth (i.e., cross-sectional diameter), or (b) producing a relatively small slender discrete mass having length considerably greater than breadth or cross-sectional diameter are produced.

641 Producing uniformly dispersed particulate fiber containing article:
This subclass is indented under subclass 640. Process wherein the article formed contains uniformly distributed relatively small, slender discrete particles having length considerably greater than its breadth or cross-sectional diameter.

642 Shaping or treating of multilayered, impregnated, or composite-structured article:
This subclass is indented under subclass 603. Process which includes forming or treating of an article or preform having plural layers, forming an infused or permeated article, or having mechanically engaged macrostructural portions.

643 Shaping followed by article coating or impregnating:
This subclass is indented under subclass 642. Process wherein, subsequent to a shaping operation, the shaped article is coated or impregnated by applying material thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:
129+, for nonsintering or vitrifying processes that combine shaping with printing or coating of a workpiece outside the mold.

SEE OR SEARCH CLASS:
427, Coating Processes, for processes including the combination of (a) firing and coating, or (b) nominal molding, significant coating, and firing; regardless of the sequence of the respective steps. However, combinations of (a) significant molding, firing, and coating, or (b) nominal shaping and nominal coating are classified in Class 264; regardless of the sequence of the respective steps.

644 Clay containing block, tile, or brick:
This subclass is indented under subclass 642. Process wherein articles or preforms undergoing treatment are, often hand-sized, usually rectangular or square, building blocks of material containing clay (i.e., an earthy material that is composed of hydrous aluminum silicates and other materials that are plastic when moist and hard when fired) identified as a block, tile, or brick.

(1) Note. Lacking an indication to the contrary, the mere use of block, tile, or brick will be considered proper for this subclass, whether or not disclosed to contain clay.

SEE OR SEARCH THIS CLASS, SUBCLASS:
601, for heat polishing or glazing Of clay containing block, tile, or brick.
609, for a particular or specific manner of positioning, arranging, or conveying of polural clay containing blocks, tiles, or bricks.
680, for process of otherwise shaping or treating block, tile, or brick combined with sintering, vitrifying, or firing outside the mold.

645 Introducing material under pressure into mold (e.g., injection molding, etc.):
This subclass is indented under subclass 603. Process wherein material under pressure from a source removed from a closed mold cavity is forced into a closed mold cavity and assumes the shape of the interior of the closed cavity.

SEE OR SEARCH THIS CLASS, SUBCLASS:
321.1, for injection molding without sintering or vitrifying.
537+, for injection molding of a hollow blank portion prior to pneumatic pressure application to the inside.

646 Utilizing chemically reactive atmosphere other than air, per se, during sintering to convert precursor to ceramic material:
This subclass is indented under subclass 603. Process wherein a solid precursor material chemically reacts with a gaseous agent, other than air, surrounding the precursor to form a new ceramic composition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
81, for reactive gas or vapor treatment of work.
85, for utilizing special inert gaseous atmosphere.
664, for specifying nonreactive heating atmosphere.
674, for utilizing specified composition of heating nonreactive atmosphere other than air.

647 Nitrogen:
This subclass is indented under subclass 646. Process wherein the reactive gaseous agent is nitrogen.

648 Using oxygen enriched gas or oxidizing atmosphere (i.e., other than air, per se):
This subclass is indented under subclass 646. Process wherein the reactive agent is identified as an oxygen enriched gas or an oxidizing gas (i.e., other than air, per se.).

649 Utilizing exothermic reaction:
This subclass is indented under subclass 603. Process wherein, during any stage in the process, materials are brought into contact with each other or with a suitable outside agent, to produce a chemical reaction that generates more heat than is required to initiate reaction.

SEE OR SEARCH CLASS:
44, Fuel and Related Compositions, for exothermic compositions.

650 Casting of film (e.g., sheet, tape, etc.):
This subclass is indented under subclass 603. Process wherein a coating of material is applied to a flat or nearly flat shaping surface and subsequently removed therefrom.

651 Removal of liquid component or carrier through porous or absorbent mold surface (e.g., slip casting, etc.):
This subclass is indented under subclass 603. Process wherein a liquid component or liquid vehicle for a moldable material is removed or separated from the material through a foamlike or absorbent shaping surface.

SEE OR SEARCH THIS CLASS, SUBCLASS:
637, for forming hollow article by removal of liquid component or carrier through porous or absorbent mold surface.

652 Sintering or vitrifying in a tunnel or channel kiln:
This subclass is indented under subclass 603. Process wherein an elongated, essentially horizontal, furnace heating means is used to sinter, or vitrify the article or preform.

SEE OR SEARCH THIS CLASS, SUBCLASS:
606, for a particular or specific manner of positioning, arranging, or conveying of plural articles or plural preforms in a tunnel or channel kiln.

653 Including plural heating steps:
This subclass is indented under subclass 603. Process wherein there are multiple steps or stages of heating.

(1) Note. Included in this subclass are processes in which (a) the temperature is varied over a given time span, (b) the preform is subjected to two or more distinct heating steps, (c) the product is cooled under controlled conditions, or (d) a portion of the product is heated or cooled at a different rate than other portions.

654 Including diverse heating of article prior to outside-mold sintering or vitrifying:
This subclass is indented under subclass 653. Process which includes at least one nonsintering or nonvitrifying heating step that precedes sintering or vitrifying of the article outside of a mold.

655 With article cutting, punching, or grinding:
This subclass is indented under subclass 654. Process which includes a step of cutting, punching, or grinding.

SEE OR SEARCH THIS CLASS, SUBCLASS:
678, for article cutting, punching, or grinding that does not involve diverse heating of material or article

656 Including nonsintering burn-off, volatilization, or melting of binder:
This subclass is indented under subclass 654. Process wherein a binder is removed during a nonsintering application of heat and wherein the binder is removed by burn-off, volatilization, or melting.

657 Of synthetic resin binder:
This subclass is indented under subclass 656. Process wherein the binder is identified as a synthetic organic polymer.

658 Including reaction of precursor to form new inorganic compound or composition:
This subclass is indented under subclass 654. Process wherein decomposition or combination of original material to form a new compound or composition occurs.

659 Forming nitride or oxynitride containing product:
This subclass is indented under subclass 658. Process wherein a product containing a binary compound of nitrogen and metal or silicon (e.g., metal nitride, silicon nitride, etc.) or tertiary compound of nitrogen, oxygen, and metal or silicon (e.g., metal oxynitride, silicon oxynitride, etc.) is produced.

660 With drying of shaped article or preform using nonsintering heat:
This subclass is indented under subclass 654. Process wherein a liquid solvent or carrier is removed from the article or preform by heating in a step distinct from sintering, fusing, or vitrifying.

661 With drying, calcining, or sintering of nonshaped particulate:
This subclass is indented under subclass 654. Process which includes heating of nonshaped loose particular material outside of a mold for purpose of drying, calcining, or sintering.

662 Including diverse heating of article subsequent to sintering:
This subclass is indented under subclass 653. Process which includes at least one nonsintering heating step that follows a sintering or firing step.

663 Subsequent hot pressing (i.e., press molding or by gas pressure):
This subclass is indented under subclass 662. Process wherein the subsequent heating is a step of hot mechanical pressing or application of a hot gas pressure greater than ambient pressure and temperature.

664 Specified temperature or pressure for hot pressing:
This subclass is indented under subclass 663. Process wherein a numeric value of either (a) temperature for pressing, or (b) mold surface pressing pressure or applied gas pressure greater than atmospheric pressure are stated in the claim.

665 Silicon nitride containing product:
This subclass is indented under subclass 662. Process wherein a silicon nitride compound containing material is produced or treated.

666 Plural sintering steps having specified temperature (e.g., presintering, etc.):
This subclass is indented under subclass 653. Process which has plural sintering steps at least one of which occurs at a specified temperature.

667 Including specified molding pressure or controlling of molding pressure (e.g., cold isostatic pressing, hydrostatic pressure, etc.):
This subclass is indented under subclass 603. Process wherein a numeric pressure for molding is claimed or wherein there is a step of controlling molding pressure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
40.3, for processes of controlling fluid pressure in direct contact with molding material which include a step of sampling, audibly or chemically testing or inspecting, or otherwise physically or mechanically determining some variable condition in a shaped article, molding material, the mold or shaping surface.

668 Producing metal nitride or silicon nitride containing product:
This subclass is indented under subclass 667. Process wherein a binary compound of nitrogen and metal or silicon (i.e., metal nitride, or silicon nitride) is produced.

669 Utilizing binder to add green strength to preform:
This subclass is indented under subclass 603. Process wherein a, usually organic, material is utilized to join particulate into a cohering self-sustaining preform capable of maintaining shape without disintegration.

(1) Note. During sintering, the shape of this temporary preform (i.e., green body) is retained due to particle-to-particle surface bonding, while organic binder is

simultaneously removed by volatilization or decomposition.

670 Of synthetic resin binder:
This subclass is indented under subclass 669. Process wherein the binder is a synthetic organic polymer.

671 Particular or specific manner of positioning, arranging or conveying of single article or preform (e.g., utilizing spacer, etc.) during sintering, vitrifying, or drying:
This subclass is indented under subclass 603. Process wherein an article or preform is placed or aligned in a particular manner or is in a particular motion other than mere conveying during sintering, vitrifying, or drying.

(1) Note. To be placed herein a patent must disclose a particular or specific manner of positioning, arranging or conveying. Nominal recitation of these steps is not considered to be significant for purposes of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
605, Particular or specific manner of positioning, arranging, or conveying of plural articles or plural preforms (e.g., stacking, utilizing spacer, etc.) during sintering,

SEE OR SEARCH CLASS:
414, Material or Article Handling, subclass 789 for processes of arranging articles, per se, for sintering.

672 To control or compensate shrinkage:
This subclass is indented under subclass 671. Process wherein an expressed purpose for positioning, arranging or conveying includes regulating contraction or uneven contraction of the article or preform during a heating or cooling operation.

673 Utilizing particulate or sintered particulate packing, or support:
This subclass is indented under subclass 671. Process wherein a particulate material is utilized to support, or partially or fully surround a shaped article or preform during sintering, vitrifying, or drying.

674 Involving specified composition of heating atmosphere other than air:
This subclass is indented under subclass 603. Process wherein the constitution of gaseous environment utilized during a heating step is specified, excluding the inherent composition of natural air.

(1) Note. Merely, specifying that the heating step takes place in air or under atmospheric conditions will not be sufficient for placement under this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
646, Utilizing chemically reactive atmosphere other than air during sintering to convert precursor to ceramic material.

675 Containing water vapor:
This subclass is indented under subclass 674. Process wherein the gaseous composition contains water vapor, excluding that water vapor which would be naturally present in air.

676 Containing nitrogen gas, noble gas, or inert gas per se:
This subclass is indented under subclass 674. Process wherein a gaseous composition contains either nitrogen, a noble gas, or a gaseous environment identified solely as being inert; excluding nitrogen gas, noble gas, or inert gas which would naturally be present in air.

677 Controlling or directing flow of heated gas or exhaust within heating chamber (e.g., sintering furnace, drying chamber, etc.) or against article:
This subclass is indented under subclass 603. Process wherein the circulation of heated gas, or expelled gas from a heating chamber (e.g., sintering furnace, drying chamber, etc.) or against an article is regulated.

678 With article cutting, punching, or grinding:
This subclass is indented under subclass 603. Process wherein a step of severing, puncturing, or abrading of an article or preform occurs.

SEE OR SEARCH THIS CLASS, SUBCLASS:

138, for nonsintering or vitrifying processes of this class with severing, removing material from preform mechanically, or mechanically subdividing of workpiece.

679 Of clay containing material:

This subclass is indented under subclass 603. Process wherein an article or preform undergoing shaping or treatment is a material containing clay (i.e., an earthy material that is composed of hydrous aluminum silicates and other materials that are plastic when moist and hard when fired).

680 Clay containing block, tile, or brick:

This subclass is indented under subclass 679. Process wherein articles or preforms undergoing treatment are, often hand-sized, usually rectangular or square, building blocks of material containing clay (i.e., an earthy material that is composed of hydrous aluminum silicates and other materials that are plastic when moist and hard when fired) identified as a block, tile, or brick.

(1) Note. Lacking an indication to the contrary, the mere use of block, tile, or brick will be considered proper for this subclass, whether or not disclosed to contain clay.

SEE OR SEARCH THIS CLASS, SUBCLASS:

601, for heat polishing or glazing of clay containing block, tile, or brick.

609, for a particular or specific manner of positioning, arranging, or conveying of polural clay containing blocks, tiles, or bricks.

644, for process of shaping or treating multi-layered or composite block, tile, or brick combined with sintering, vitrifying, or firing outside the mold.

681 Producing metal oxide containing product:

This subclass is indented under subclass 603. Process wherein an article or preform undergoing shaping or treatment is a material containing a metal oxide.

682 Producing silicon carbide containing product:

This subclass is indented under subclass 603. Process wherein a product containing a binary compound of carbon and silicon is produced.

683 Producing silicon nitride containing product:

This subclass is indented under subclass 603. Process wherein a product containing a binary compound of nitrogen and silicon is produced.

CROSS-REFERENCE ART COLLECTIONS

900 DIRECT APPLICATION OF FLUID PRESSURE DIFFERENTIAL TO SHAPE, RESHAPE (I.E., DISTORT), OR SUSTAIN AN ARTICLE OR PREFORM AND HEAT-SETTING (I.E., CRYSTALLIZING OF STRETCHED OR MOLECULARLY ORIENTED PORTION) THEREOF:

This subclass is indented under the class definition. Cross-reference art collection directed to a process under the ... wherein (a) elongation or molecular alignment of at least a portion of a workpiece occurs when positive or negative fluid pressure differential is applied through a medium of liquid or gas in direct contact with the workpiece, and the elongated or aligned portion of the workpiece is heated to stabilize the shape thereof by crystallizing; or (b) the shape of a previously elongated or molecularly oriented workpiece is maintained by application of a positive or negative fluid pressure differential while the workpiece is heated to stabilize the shape thereof by crystallizing.

(1) Note. In this subclass, crystallizing refers to the establishment of a long range order within the polymeric mass wherein intermolecular attractions (e.g., hydrogen bonding, Van der Vaal forces, etc.) stabilize the polymeric chains into a regular lattice often typified by a characteristic X-ray diffraction pattern.

(2) Note. Heat-setting improves stabilization of blow-molded or vacuum-formed articles against shrinkage or deformation when in use in an elevated temperature environment.

901 Heat-setting of stretched or molecularly oriented article formed from planar preform (e.g., sheet, film, etc.):
Process under cross-reference art collection 900 wherein (a) differential fluid pressure is used to cause stretching or molecular orientation of at least a portion of a planar preform, and (b) at least part of the stretched or oriented portion is subjected to heat-setting.

902 Production of continuous length:
Processes under cross-reference art collection 900 in which a product of indefinite length is produced.

903 Heat-setting and simultaneous differential heating of stretched or molecularly oriented section of article or preform:
Process under cross-reference art collection 900 wherein subsequent to elongating or molecularly orienting using differential fluid pressure, the stretched or molecularly oriented workpiece is simultaneously heat-set and subjected to differential heat treatment such that one section of the stretched or oriented portion of the workpiece is subjected to a higher temperature than another section of the stretched or oriented portion of the workpiece.

(1) Note. If there is a heat differential between an unoriented neck portion of an article and an oriented portion of the same article, placement under this subclass is improper unless there is also a heat differential within the oriented (i.e., non-neck) portion of the article.

904 Maintaining article in fixed shape during heat-setting:
Process under cross-reference art collection 900 wherein the shape of a previously stretched or molecularly oriented workpiece is sustained by application of a positive or negative fluid pressure differential while the workpiece undergoes heat-setting.

905 Having plural, distinct differential fluid pressure shaping steps:
Process under cross-reference art collection 900 in which there are at least two separate shaping or reshaping steps caused by application of differential fluid pressure.

906 And heat-shrinking outside of mold including subsequent re-expanding of shrunken article using differential fluid pressure:
Process under cross-reference art collection 904 wherein a stretched or molecularly oriented workpiece is heated, outside of a mold, to contract at least one dimension thereof, thus forming a shrunken article; and thereafter applying a differential fluid pressure to enlarge the shrunken article.

907 DIRECT APPLICATION OF FLUID PRESSURE DIFFERENTIAL TO SHAPE, RESHAPE (I.E., DISTORT), OR SUSTAIN AN ARTICLE OR PREFORM AND CRYSTALLIZING OF NONSTRETCHED OR MOLECULARLY UNORIENTED PORTION THEREOF:
This subclass is indented under the class definition. Cross-reference art collection directed to a process under the ... wherein (a) a positive or negative fluid pressure differential is applied through a medium of liquid or gas in direct contact with a workpiece to form, reform, or sustain the workpiece, and (b) the workpiece is treated to crystallize only a nonelongated or molecularly unoriented portion thereof.

(1) Note. In this subclass, crystallizing refers to the establishment of a long range order within the polymeric mass wherein intermolecular attractions (e.g., hydrogen bonding, Van der Vaal forces, etc.) stabilize the polymeric chains into a regular lattice often typified by a characteristic X-ray diffraction pattern.

(2) Note. In this subclass, crystallizing is not limited to use of heating or cooling. Thus, utilization of only pressure to crystallize would be proper hereunder.

908 Crystallizing of neck portion of hollow article or hollow preform:
Process under cross-reference art collection 907 wherein crystallizing occurs at least in a hollow neck region of a hollow workpiece.

909 DIRECT APPLICATION OF FLUID PRESSURE DIFFERENTIAL TO STRETCH AN ARTICLE OR PREFORM

AND HEAT SHRINKING OF STRETCHED ARTICLE OR PREFORM:
This subclass is indented under the class definition. Cross-reference art collection directed to a process under the ... wherein (a) elongation of a workpiece occurs when a positive or negative fluid pressure differential is applied through a medium of a liquid or gas in direct contact with the workpiece, and (b) the resulting elongated workpiece is heated to contract at least one dimension thereof, thus forming a shrunken article.

SEE OR SEARCH THIS CLASS, SUBCLASS:
900+, for heat-setting of stretched or molecularly oriented articles.
906+, for crystallizing of a nonstretched or molecularly unoriented portion of a workpiece.

910 SINTERING TO PRODUCE TRANSLUCENT INORGANIC ARTICLE:
This subclass is indented under the class definition. Cross-reference art collection for process of producing an inorganic article which permits passage of diffused light such that objects are not clearly seen therethrough.

SEE OR SEARCH THIS CLASS, SUBCLASS:
1.1+, for optical article shaping or treating processes directed to forming articles capable of producing an optical effect.

911 RECYCLING CONSUMER USED ARTICLES OR PRODUCTS:
This subclass is indented under the class definition. Processes wherein reusable materials are recovered from worn or nonvirgin consumer used articles and formed into useful products by a molding operation.

912 From toroidal shapes (e.g., resilient tires, etc.):
This subclass is indented under subclass 910. Processes wherein the consumer used article from which useful material is recovered is toroidal shaped (e.g., doughnut shaped).

(1) Note. A toroidal shape is comprised of a solid figure generated when rotated about an axis lying in the same plane therewith, but not intersecting or containing, an axis in its own plane.

(2) Note. The majority of the art in this subclass relates to processes for recovering useable material from worn or damaged vehicle tires, but the subclass is not so limited.

913 From fiber or filament, or fiber or filament containing article or product (e.g., textile, cloth, fabric, carpet, fiberboard, etc.):
This subclass is indented under subclass 910. Processes , wherein the consumer used article from which useful material is recovered is a fiber or filament containing product or fiber or filament, per se.

(1) Note. A fiber or filament is generally considered a relatively slender, flexible element of macroscopic size having a length substantially greater than its width.

914 From cellulose containing articles (e.g., paper, etc.):
This subclass is indented under subclass 912. Processes wherein the fiber or filament containing product or fiber or filament, per se, contains cellulose.

(1) Note. Cellulose, which is used in the manufacture of paper, is a carbohydrate polymer of glucose residue units found in the walls and skeletons of vegetable cells.

915 From inorganic material containing articles or products (e.g., hydro-set, cement, plaster, wire, cable, etc.):
This subclass is indented under subclass 910. Processes wherein the consumer used article from which useful material is recovered contains inorganic matter.

(1) Note. Inorganic material which also contains organic material as bonding agents, solvents, fillers, etc., is properly classified herein.

(2) Note. Inorganic material which also contains organic material as bonding agents, solvents, fillers, etc., is properly classified herein.

916 From porous material containing articles (e.g., sponge, foam, etc.):
This subclass is indented under subclass 910. Processes wherein the consumer used article from which useful material is recovered contains randomly dispersed pores or voids.

917 By blow molding material recycled from consumer used article or product:
This subclass is indented under subclass 910. Processes wherein the material recovered from the consumer used article is reused in a blow molding operation.

(1) Note. Blow molding is considered an operation wherein a positive or negative pressure is applied through the medium of a liquid or gas in direct contact with a work-piece to form or maintain a desired configuration.

918 From hollow- or container-type articles (e.g., tubes, bottles, cups, etc.):
This subclass is indented under subclass 910. Processes wherein the consumer used article from which useful material is recovered has an intentionally constructed non-random void or opening therethrough or has a non-random inner or concave surface or cavity.

919 From pipe or tube (e.g., hose, etc.):
This subclass is indented under subclass 917. Processes wherein the consumer used article from which useful material is recovered is a self supporting open ended hollow conduit (e.g., hose, etc.).

920 By extruding material recycled from consumer used article or product:
This subclass is indented under subclass 910. Processes wherein the material recovered from the consumer used article is reused in an extrusion operation.

(1) Note. Extrusion molding is considered an operation wherein an article is shaped or formed by forcing a supply of the article forming material through a confining and shaping orifice.

921 By injection molding material recycled from consumer used article or product:
This subclass is indented under subclass 910. Processes wherein the material recovered from the consumer used article is reused in an injection molding operation.

(1) Note. Injection molding is considered an operation wherein pressure is applied to a molding material so as to force said material from a source removed from a closed mold cavity into said cavity wherein the material assumes the shape of the interior of the closed cavity.

FOREIGN ART COLLECTIONS

The definitions for FOR 100-FOR 102 below correspond to the definitions for only the following abolished subclasses under Class 264 from which these collections were formed: 36 - 38. See the Foreign Art Collection schedule for specific correspondences. [**Note:** The titles and definitions for *indented* art collections include all the details of the one(s) that are hierarchically superior.]

FOR 100 REPAIRING OR RESTORING ARTICLES FOR REUSE (264/36):
Foreign art collections including processes in which a worn, damaged, or used article is restored or repaired for reuse in a similar capacity without altering or destroying the over-all configuration of said article.

FOR 101 RECYCLING OF RECLAIMED OR PURIFIED PROCESS MATERIAL (264/37):
Foreign art collections including processes in which excess, flash, trim, rejected products or used molding materials resulting from an intermittent or continuous process or treating materials therefor, are recycled or reused in the molding operation with or without purification, reclamation or separation of the desired constituents from contaminants.

FOR 102 Of extrudant-receiving bath material (264/38):
Foreign art collections including processes in which the bath contents or ingredient thereof into which article forming material is extruded directly is reused by recycling thereof.

END