

CLASS 366, AGITATING**SECTION I - CLASS DEFINITION**

This is the residual class for apparatus for, and corresponding methods of operating on fluid, viscous, plastic, or fluent particulate material solely for causing portions of the material to move irregularly with respect to each other so as to intermix. The material may be in motion or at rest immediately before agitation.

Apparatus for agitating articles which are treated in the same manner as fluent particulate material will also be included in this class, unless classified elsewhere.

This class (366) includes apparatus for forming colloid systems (such as suspensions, emulsions) by agitation, not elsewhere provided for. See LINES WITH OTHER CLASSES AND WITHIN THIS CLASS, below, for related information.

This class (366) also includes stirrers, per se, which are disclosed for use as agitators. However, see Lines With Other Classes, below, for impellers.

[Note: Patents issued prior to 1945 have not in all instances been classified by their claimed disclosure so that placement of these older patents does not necessarily indicate lines of classification.]

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

See appropriate composition classes for processes which form colloid systems (such as emulsifying or foaming), and see Class 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, for processes of making, stabilizing, breaking, or inhibiting colloid systems when such is generically claimed (no claimed art use for the composition) or when there is no hierarchically superior provision in the USPC for the specifically claimed art to the composition of the colloid system.

See Class 241, Solid Material Comminution or Disintegration, for the generically claimed subject matter of comminuting solid material in a fluid to form or improve a non-colloid suspension. Processes of forming non-colloid suspensions or dispersions of solids in fluids, and in which the ingredients of the non-colloid suspensions or dispersion are not claimed with such particularity as to form a basis for classification in Class 252, the that are an integral part therein, or some other

appropriate composition class, are classified in Class 241. In general, Class 241 provides for all apparatus for forming suspensions of solids in fluids by comminution, whether such suspensions are disclosed as colloid-sized or not.

See Class 138, Pipes and Tubular Conduits, subclasses 40+ for conduit provided with a flow restrictor disclosed for use in forming emulsions of a plurality of fluids. Where such apparatus has additional combined features, such as means to feed material to the restrictor, etc., the patents have been placed in this Class 366.

See Class 127, Sugar, Starch, and Carbohydrates, subclass 14, for mixing devices for a sugar-bearing solution with other liquids or solids for promoting the separation of impurities from the solution.

See Class 366, Agitating, subclasses 69+ for apparatus which may be used for working liquid into a gel, subclasses 101+ for apparatus which includes agitation and injection of gas which may be a foam, subclasses 108+ for apparatus wherein the agitation is effected by vibratory device, subclass 176.1+ for apparatus for forming suspensions or emulsions wherein the feed means is in the form of a pump for forcing the material through a narrow restriction for the purpose of mixing the material, particularly for the purpose of emulsifying or homogenizing the material, subclasses 279+ for apparatus with rotatable stirrer which may be used for making lather or foam, cross-reference art collection 604 for mixing apparatus for making foam or lather, cross-reference art collection 605 for mixing apparatus for stirring of paint.

See Class 416, Fluid Reaction Surfaces (i.e., Impellers), appropriate subclasses for an impeller, per se, which may be useful as a stirrer but where the disclosed use is solely as an impeller, or alternatively as an impeller or stirrer.

Since agitation of material is incidental or ancillary to many apparatuses for treating material for various purposes, an agitator in combination with other means for treating material will be found in the class providing for the particular treatment. Similarly, an apparatus for treating or handling material which inherently or incidentally agitates the material will be included in the appropriate class providing for the treating or handling means. Cross references have been placed in this class (366) where the agitating mechanism claimed in combination with other treating means has been deemed to have general utility as an agitator.

Also see References To Other Classes, below, for additional lines between this class (366) and other classes and for references to the following:

Apparatus Including Agitating Incidental to or Combined with Other Primary Areas;

Agitating Apparatus Classified Elsewhere;

Feeding and Discharging Subcombinations;

Agitator Subcombinations Classified Elsewhere.

SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 159 for manipulative processes of agitating textile material immersed in Liquid for purposes of mechanical or chemical treatment other than impregnating or coating (e.g., washing, bleaching, dyeing). (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 23, Chemistry: Physical Processes, subclasses 313+ for a process of agglomerating particulate nonmetallic elements or inorganic compounds by agitation (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 34, Drying and Gas Vapor Contact With Solids, for a process or apparatus for drying material including an agitating step or means. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 53, Package Making, appropriate subclasses for packaging methods and apparatus including agitation of the material packaged, and see particularly subclass 525 for apparatus for agitating or jarring material in a filled container for compacting the material. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 53, Package Making, subclass 525 for apparatus for agitating or jarring material in a filled container for the purpose of compacting the material. (For Agitating Apparatus Classified Elsewhere)
- 62, Refrigeration, appropriate subclasses for processed and apparatus for removing heat from

material which may include agitation of the material. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)

- 65, Glass Manufacturing, subclasses 178+ for glass working apparatus combined with means for agitating molten glass. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 68, Textiles: Fluid Treating Apparatus, appropriate subclasses, particularly subclasses 131+ for apparatus for agitating textile material immersed in liquid for purposes of mechanical or chemical treatment other than impregnating or coating (e.g., washing machine). (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 74, Machine Element or Mechanism, appropriate subclasses for mechanisms which might be useful in transmitting motion to a stirrer or a movable mixing chamber.
- 99, Food and Beverages: Apparatus, appropriate subclasses for food treating apparatus of that class combined with agitating means; see particularly subclasses 452+ for apparatus for treating dairy food, and subclasses 518+, 600+ and 623+ for grain hulling agitating step. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 118, Coating Apparatus, subclasses 400+ for coating apparatus involving agitation of the base and coating materials. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 126, Stoves and Furnaces, subclasses 155 through 157 for a grate having agitating means for clearance of ashes or subclass 387.1 for an open-top liquid heating vessel that may include a lid having an agitator or circulator using the heated liquid within the vessel.
- 134, Cleaning and Liquid Contact With Solids, appropriate subclasses for processes and apparatus for Cleaning or Liquid Contact With Solids including a carrier or holder for the solid, and also including agitation of the material to promote, facilitate, or perfect the cleaning or Liquid Contact. The agitation may be caused by movement of the carrier through the Liquid or by a separate agitator. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 137, Fluid Handling, appropriate subclasses for transfer process and apparatus for fluent mate-

- rial which includes agitation or mixing of the material and see particularly subclasses 3+ for processes, and subclasses 87+, 599+ and 602+ for apparatus. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 138, Pipes and Tubular Conduits, subclasses 40+ for a conduit with a flow restrictor or deflector disclosed for use in forming emulsions of a plurality of fluids. Where such a conduit has additional combined features, such as means to feed material to restrictor, etc., the patents have been placed in Class 366, subclasses 176.1 or 336+. (For Agitating Apparatus Classified Elsewhere)
- 165, Heat Exchange, subclass 109.1 for heat exchange apparatus including agitating means for a fluent heat exchange medium therein. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 166, Wells, subclass 177.7 for agitating means in combination with a well or disclosed solely for use in a well. (For Agitating Apparatus Classified Elsewhere)
- 172, Earth Working, appropriate subclasses for methods and apparatus for agitating earth in situ. (For Agitating Apparatus Classified Elsewhere)
- 193, Conveyors, Chutes, Skids, Guides, and Ways subclass 2 and 11 for a chute combined with means to agitate the material so as to aid its flow along the chute. (For Feeding And Discharging Subcombinations)
- 198, Conveyors: Power-Driven, subclasses 750+ for an oscillating conveyor, and subclasses 752+ for a vibrating endless through conveyor, per se. (For Feeding And Discharging Subcombination)
- 201, Distillation: Processes, Thermolytic, subclass 33 for a distillation process including the step of agitating the charge in the carbonizing zone. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 202, Distillation: Apparatus, subclass 175 and 265 for distillation apparatus combined with agitating means for the distilland. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 204, Chemistry: Electrical and Wave Energy, subclass 221, 222, 223, 261, and 273, for electrolytic cells including agitating means. (For Agitating Apparatus Classified Elsewhere)
- 209, Classifying, Separating, and Assorting Solids, appropriate subclasses for methods and apparatus directed to subject matter of that class, and see particularly subclasses 233+ for the combination of a sifter with an agitator. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 210, Liquid Purification or Separation, appropriate subclasses for methods and apparatus for separating solids from Liquids, and see particularly subclasses 198.1+ or a separator with means to add treating material which may include agitating means. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 219, Electric Heating, subclasses 296+ for an electric heating apparatus for a Liquid with means to circulate the Liquid in a fixed path in relation to heat surface so as to transfer heat to the Liquid. Where electrical heating means is only broadly claimed, placement will be in Class 366; but where details of the heater or control means for the heater are claimed, placement will be in Class 219. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 222, Dispensing, both Classes 222 and 366 have the combination of a container and a device operable on the container contents to mix the same, and means to discharge the contents. Class 366 takes (1) agitators with means to feed material thereto; (2) containers having means to agitate, which means are inoperable to assist discharge (e.g., where the agitator is inoperative during discharge) and such means combined with additional dispensing means; and (3) any means particularly designed to agitate with only an incidental discharge assisting function (e.g., those device in which the agitator must operate prior to a dispensing operation, even though it operates during and assists the discharge operation). Class 222 takes containers of any kind with (1) devices particularly designed to convey material therefrom or produce a force on the material therein, in a discharge direction with only incidental agitation effect; (2) agitators combined with other non-gravity discharge assistance and operable together only during the discharging operation (the agitator-receptacle subcombination going to Class 366); and (3) mere solid material bridge breakers operable to promote gravity flow toward a claimed container outlet or discharge assisting means. (Apparatus Including

- 239, Agitating Incidental To Or Combined With Other Primary Function)
Fluid Sprinkling, Spraying, and Diffusing, appropriate subclasses for processes an apparatus (1) for projection or spraying material which required mixing just prior to or at discharge (e.g., resin type cements), usually with a catalyst to cause solidification or setting up, or (2) comprising particular nozzle structure of type provided for in Class 239, combined with agitation or mixing of ingredients in the supply means, provided the ingredients are not of the mortar type provided for in Class 366, subclasses 1+. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 241, Solid Material Comminution or Disintegration, appropriate subclasses for processes and apparatus (1) in which agitating steps or means are combined with comminuting steps or means, or (2) which, by disclosure, will function to comminute the material even if a mixing function is also disclosed. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 252, Composition, appropriate subclasses for processes of making compositions provided therein which may include agitation of the material, and see the notes to the main class definition of Class 252. See also Lines With Other Classes, above. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 261, Gas and Liquid Contact Apparatus, appropriate subclasses for a process or apparatus for mixing a liquid with a gas. (For Agitating Apparatus Classified Elsewhere)
- 248, Supports, subclasses 128+ for supports for mere movable receptacles, and subclasses 146+ for supports for stationary receptacles.
- 416, Fluid Reaction Surfaces (i.e., Impellers), appropriate subclasses for an impeller, per se, which may be useful as a stirrer but where the disclosed use is solely as an impeller, or alternatively as an impeller or stirrer. (For Agitator Subcombinations Classified Elsewhere)
- 425, Plastic Article or Earthenware Shaping or Treating: Apparatus, subclass 222 for tumbling type agglomerating apparatus for particulate material. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 427, Coating Processes, subclass 242 for processes of coating by rumbling or tumbling. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 432, Heating, the residual class for generating heat and applying it to materials, subclasses 121+ for a heating chamber with more than nominally recited heat generating means and including means for guiding or moving material to be heated through or moving material to be heated through or along sections of the chamber, or for agitating such material within the chamber. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 435, Chemistry: Molecular Biology and Microbiology, appropriate subclasses for fermentation processes and apparatus; see particularly subclasses 290.3+ for a composting apparatus including an agitation means; subclasses 291.5+ for a malting or mashing apparatus, including an agitation means; subclasses 295.1+ for a bioreactor including a draft tube as a means for agitation; subclass 296.1 for a bioreactor with a sparging means for agitation; subclasses 297.2+ for perfusion bioreactors; subclass 298.2 for a rotatably mounted bioreactor; and subclass 303.3 for an agitated incubator. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 451, Abrading, subclasses 32+ and 326+ for a process or apparatus disclosed for use in tumbling a workpiece for the purpose of abrading or surface finishing the workpiece. The abrading or surface finishing may be solely by mutual attrition of the workpieces or by an abrasive medium. (Apparatus Including Agitating Incidental To Or Combined With Other Primary Function)
- 475, Planetary Gear Transmission Systems or Components, appropriate subclasses, for planetary gear transmissions which might be used to transmit motion to a stirrer or mixing chamber; and particularly subclass 11 for rotary planetary output.

SECTION IV - GLOSSARY

AGITATOR

A stirrer or a deflector.

DEFLECTOR

(1) An element or device secured within and in fixed

relation to the mixing chamber, or (2) a stationary device in a movable mixing chamber for diverting or separating portions of material and then permitting them to recombine so as to commingle, thus causing or assisting in agitation of the material.

MATERIAL

A mass of fluid, viscous, particulate, or plastic substance which is to be agitated.

MIXING CHAMBER

A space bounded on at least three sides by well structure within which agitation takes place. The chamber may be in the form of a trough, a conduit, or a container of any shape. A supply reservoir or a conveyor for feeding material to a mixing chamber and which includes means for agitating the material prior to its entry into the mixing chamber will not be considered a mixing chamber.

OSCILLATING

Rotating alternately in opposite directions about an axis.

RECIPROCATING RECTILINEARLY

Moving bodily back and forth in a straight line in the same path so that at any instant, all parts of the moving body move in the same direction at the same rate.

ROCKING

Moving back and forth as a result of a back and forth motion of a curved surface on a flat surface.

ROTATING

Turning in but one direction about an axis.

STIRRER

A device which is movable by an applied force and which in its movement causes agitation of material. The force may be applied manually, by movement of the material, by relative motion of the chamber, or by a power source, either directly or through a drive train.

STIRRERS, PLURAL

Two or more devices or elements which are movable bodily by an applied force and which move bodily relative to each other and in such movement cause agitation of material. Where a plurality of like or diverse stirrer

elements are in fixed relation to each other and move together as a unit they will be considered a single stirrer even if the elements are adjustable relative to each other prior to agitation or are flexible so that portions thereof move relative to each other during agitation.

SUBCLASSES

1 MORTAR MIXER TYPE:
This subclass is indented under the class definition. Apparatus and corresponding methods peculiarly adapted for mixing mortar, asphaltic and hydraulic cement, concretes, and the like.

SEE OR SEARCH CLASS:

- 23, Chemistry: Physical Processes, subclass 287 for lime hydrators.
- 172, Earth Working, subclass 371 for mortar mixing hoes.
- 404, Road Structure, Process, or Apparatus, appropriate subclasses for (1) highway, pathway, or walkway structure, per se, and (2) process and apparatus for making, installing, repairing, or maintaining such structure, where such structure, process or apparatus is not otherwise classifiable as either (a) specifically provided for in other loci, or (b) of such general utility as to be provided for on that basis (see section III and IV under Class 404 class definition for known collections of such nature and the particular lines of demarcation).

2 Methods:
This subclass is indented under subclass 1. Processes of mixing mortar, asphaltic or hydraulic cement, concrete, and the like.

SEE OR SEARCH CLASS:

- 106, Compositions: Coating or Plastic appropriate subclass, particularly subclasses 273+ and 638+ for processes of making mortar, asphaltic or hydraulic cement, concrete, and like which are not distinct from the compositions thereof.

3 Gas incorporating; fluid mixing, delivering, or conveying:
This subclass is indented under subclass 2. Processes comprising a step or steps of (1) incorporating air or gas with the product, or (2)

mixing, delivering, and/or conveying the product through the medium of a fluid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

10, for corresponding apparatus.

SEE OR SEARCH CLASS:

406, Conveyors: Fluid Current, subclasses 86+ for moving material along a surface by means of or with the assistance of a fluid current issuing from the surface and incidentally agitating the material; and subclasses 136+ for agitation of material in a receptacle which feeds to a fluid current conveyor.

4 With heating or cooling:

This subclass is indented under subclass 3. Processes which include the steps of modifying the temperature of the material.

(1) Note. The temperature modification may occur before, during, or after agitation.

5 Gas incorporating at delivery:

This subclass is indented under subclass 3. Processes which include the steps of introducing a fluid with a material at the deliver.

6 Treatment or preparation of material:

This subclass is indented under subclass 2. Processes which include other steps for making a material ready for mixing, or modifying a material for the purpose of facilitating the mixing.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

3, for process combinations involving gas incorporating, fluid mixing, discharging, and/or conveying.

SEE OR SEARCH CLASS:

137, Fluid Handling, subclasses 3+ for fluid handling processes, including mixing plural fluids.

7 By heating or cooling:

This subclass is indented under subclass 6. Processes wherein the treatment or preparation is the step of modifying the temperature of the material.

8 By ingredient proportioning:

This subclass is indented under subclass 6. Processes wherein the treatment or preparation is the step of controlling the relative quantities of different materials which are mixed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

16+, for corresponding apparatus.

160.1+, for feed means of general utility for feeding material in an adjustable ratio to a mixing chamber.

162.1+, for feed means of general utility for feeding material to a mixing chamber in a predetermined fixed ratio.

9 Gravity type:

This subclass is indented under subclass 1. Subject matter wherein the mixing is effected by the single passage of streams of materials through intersecting paths or over baffles or the like obstructions which may be either stationary or movable, at least one of said streams being gravity impelled.

(1) Note. The term "single passage" is construed to exclude mixers such as those having rotting or oscillating receptacles which effect mixing by lifting and dropping material over a baffle or baffles a plurality of times.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

336+, for similar mixers of general application.

10 With gas incorporating; fluid mixing, delivering, or conveying:

This subclass is indented under subclass 1. Subject matter for (1) incorporating air or gas with a material, or (2) having means for mixing, delivering and/or conveying a material through the medium of a fluid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

3, for corresponding processes.

25, for apparatus for heating ingredients during mixing by direct application of heated cases thereto.

SEE OR SEARCH CLASS:

222, Dispensing, subclasses 3+ for gas dispensing, 630+ for fluid flow discharge, and 195 for gas agitation.

406, Conveyors: Fluid Current, subclasses 86+ for moving material along a surface by means of or with the assistance of a fluid current issuing from the surface and incidentally agitating the material; and subclasses 136+ for agitation of material in a receptacle which feeds to a fluid current conveyor.

11 Gas incorporating at delivery nozzle:

This subclass is indented under subclass 10. Subject matter wherein the medium of a fluid is introduced with the material at the delivery nozzle.

12 Into rotating mixing chamber:

This subclass is indented under subclass 10. Subject matter wherein the medium of a fluid is introduced into a mixing chamber which revolves about a fixed axis in one direction only.

13 With rotatable stirrer:

This subclass is indented under subclass 10. Subject matter wherein the medium of a fluid is introduced into a mixing chamber which has a stirrer which turns in but one direction about an axis.

14 Plural mixing chambers:

This subclass is indented under subclass 1. Subject matter wherein the mixing is effected two or more separate mixing chambers.

(1) Note. The mixing chambers may be arranged to have either consecutive or alternative flow therethrough of the material being mixed, and the chambers may be concentrically arranged.

(2) Note. Where agitation is provided for in a container or conveyor and which agitation is incidental to the dynamic charging of a mixing chamber from the container or conveyor. Classification is in subclasses 30+.

(3) Note. For purposes of the classification, a compartmented mixing chamber is considered to be a single mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

13, for a compartmental type rotatable mortar mixing chamber.

15 Intercommunicating:

This subclass is indented under subclass 14. Subject matter wherein the plural mixing chambers are in communication with each other so that the material being mixed may flow from one chamber to another.

16 With ingredient proportioning:

This subclass is indented under subclass 1. Subject matter including means for controlling or regulating the ratio of the ingredients to be mixed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8, for corresponding process.
160.1+, for mixing ratio control of general use.

SEE OR SEARCH CLASS:

137, Fluid Handling, subclasses 88+ and 98+ for proportioning means, per se.
177, Weighing Scales, subclass 61 for a weigh chamber translatable among plural sources.
222, Dispensing, subclass 57 and 129+ for dispensing of plural sources.

17 By condition sensing means:

This subclass is indented under subclass 16. Subject matter wherein the amount of ingredients to be added to a batch of mixed ingredients in the mixing chamber is controlled or regulated by (1) means in said chamber to detect a condition of said batch (e.g., temperature, density, etc.) or (2) means external said chamber to detect a condition of the chamber, per se (e.g., change in the amount of energy required to rotate the chamber).

- 18 By weight:**
This subclass is indented under subclass 16. Subject matter wherein the ratio of the ingredients to be mixed is controlled or regulated by respectively weighing a quantity of each of a said ingredients, prior to charging the mixing chamber with the same.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
141, for weighing material of general use.
- 19 By volume:**
This subclass is indented under subclass 16. Subject matter wherein the ratio of the ingredients to be mixed is controlled or regulated by respectively measuring a quantity of each of said ingredients volume, prior to charging the mixing chamber with said ingredients.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
160.5, for feed means of general utility for proportioning materials fed to a mixing chamber in which the volume of material is measured.
- 20 By screw conveyor charging means:**
This subclass is indented under subclass 16. Subject matter wherein controlled or regulated by having a different rotational speed and/or convolution size for the screw conveyor means used to dynamically charge the mixing chamber with said ingredients.
- 21 By varying opening of charging means:**
This subclass is indented under subclass 16. Subject matter wherein the ratio of ingredients to be mixed is controlled or regulated by respectively adjusting the gets or valve means at each other outlet opening of the charging means to vary the size of said opening and thereby control the amount of ingredients that egress the charging means and flow into the mixing chamber.
- 22 With heating or drying:**
This subclass is indented under subclass 1. Subject matter including means to heat or dry a material before, during, and/or after the mixing operation.
- (1) Note. The material may be subjected to agitation during the preheating operation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
14, for plural mortar mixers.
- SEE OR SEARCH CLASS:
34, Drying and Gas or Vapor Contact With Solids, and see the note to the main class definition for the line.
404, Road Structure, Process, or Apparatus, subclasses 90+, 92, 95, and 108+ for road making apparatus including heating means.
- 23 Heating mixing chamber and ingredient preheater:**
This subclass is indented under subclass 22. Subject matter wherein the heating means heats the material prior to and during the mixing in a mixing chamber.
- 24 Heating mixing chamber:**
This subclass is indented under subclass 22. Subject matter wherein the heating means heats a mixing chamber.
- 25 By hot gases to interior:**
This subclass is indented under subclass 24. Subject matter wherein the heating means is a high temperature fluid introduced within the mixing chamber.
- 26 With elevating means:**
This subclass is indented under subclass 1. Subject matter including means for bodily raising and lowering the mixing chamber as a unit to convey the chamber from a charging station to a delivery station.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
45+, for mixer receptacles which merely tilt to dump.
- SEE OR SEARCH CLASS:
212, Traversing Hoists, for elevating means of that class type.
254, Implements or Apparatus for Applying Pushing or Pulling Force, for elevating means of that class type.

- 414, Material of Article Handling, subclasses 592+ for an elevator or hoist and loading or unloading means therefor, and see the search notes of that subclass for other subclasses of that class (414) which include means for raising or lowering a load.
- 27 With dynamic charging and dynamic delivery:**
This subclass is indented under subclass 1. Subject matter including means for directly applying a force to a material in order to move the material toward or into the mixing chamber and forcible removing material therefrom.
- (1) Note. For purposes of this classification the term "charging" has been limited to positively feeding aggregates or conducting liquid to the mixer receptacle.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
16+, for proportioning and feeding of ingredients.
- 28 Interrelated:**
This subclass is indented under subclass 27. Subject matter including means for mechanically or otherwise connecting the charging and delivery means to operate in a related manner.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
131+, for interrelated feed and discharge of mixers having general use.
- 29 With automatic control means:**
This subclass is indented under subclass 28. Subject matter including means (1) to directly control the operation of the charging and delivery means, or (2) to control the enabling or disabling of devices for manually controlling the charging and delivery means.
- SEE OR SEARCH CLASS:
235, Registers, subclass 128 and 132 for rotation counters with alarm or predetermined stop mechanism.
- 30 With dynamic charging:**
This subclass is indented under subclass 1. Subject matter including means for directly applying force to a material in order to move
- the material toward or into the mixing chamber, and the corresponding methods.
- (1) Note. This subclass does not include those methods and devices in which material is permitted to enter the mixing chamber solely under the influence of gravity.
- (2) Note. The material to which the force is applied may be any one of the components of the mixture and may be liquid.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
41, for a gravity type charge hopper or chute.
76.3, for a screw conveyor for feeding material into a rubber or heavy plastic working apparatus.
- 31 By vibration:**
This subclass is indented under subclass 30. Subject matter wherein the force is applied to the material by vibrating element in the path conducting the material to the mixing chamber.
- (1) Note. The vibrating element may be an element of the device conducting the material to the mixing chamber.
- (2) Note. The vibratory motion may be induced by a single striking movement upon the vibrating element.
- 32 Of skip or hopper:**
This subclass is indented under subclass 31. Subject matter wherein the vibration is applied to one or more walls of a skip or hopper supplying the material to the mixing chamber.
- 33 Plural charge means:**
This subclass is indented under subclass 30. Subject matter having more than one charging means.
- (1) Note. Included herein are mixing chambers having both dynamic and static (e.g., hopper) charger means.
- (2) Note. If a single dynamic charge device applies force to a plurality of streams of material, classification will be in subclass 30.

34 Including dynamic liquid charge:

This subclass is indented under subclass 33. Subject matter wherein at least one of the charge means applies force directly to a liquid to move the liquid into the mixing chamber.

- (1) Note. The force applying means is generally of the pump type. Where the force applying means is of the gravitational type or is unspecified, classification will be in subclass 36 or 40, as appropriate.
- (2) Note. Where such force applying means is the only charge means, classification is in subclass 30.

35 Including screw conveyor:

This subclass is indented under subclass 33. Subject matter wherein at least one of the charge means includes a screw conveyor.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 20, for ingredient proportioning by screw conveyor charging means.
- 38, for a single charge by a screw conveyor.

36 Skip and liquid:

This subclass is indented under subclass 33. Subject matter wherein the dynamic charge means is a skip or tilting bucket, and another charge means conducts liquid to the mixing chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 34, for a dynamic type liquid charge means.

SEE OR SEARCH CLASS:

- 414, Material or Article Handling, appropriate subclasses for skip handling structure, per se.

37 Plural dynamic:

This subclass is indented under subclass 33. Subject matter having more than one charge means and a force is applied directly to the material in each charge means.

38 By screw conveyor:

This subclass is indented under subclass 30. Subject matter wherein the force applying means is a screw conveyor.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 35, for a similar device with additional charge means.
- 76.3, for a screw conveyor for feeding material into a rubber or heavy plastic working apparatus.

39 Skip:

This subclass is indented under subclass 30. Subject matter wherein the dynamic charge means is a skip or tilting bucket.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 36, for a skip and liquid charging device.

SEE OR SEARCH CLASS:

- 414, Material or Article Handling, subclass 683 for a device for loading a concrete mixer which device includes means for swinging it in a vertical plane.

40 With liquid charge:

This subclass is indented under subclass 1. Subject matter including means for supplying liquid to the mixing chamber without the direct application of force to the liquid.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 30+, for dynamic charge liquid to the mixing chamber.
- 33+, for charge of liquid additional to the dynamic charge of other material to the mixing chamber.

41 Movable charge hopper or chute:

Subject matter under 1 wherein material is supplied to a mixing chamber by a container or static conveyor, at least one portion of which is capable of relative motion with respect a mixing chamber.

- (1) Note. Motion of the mixing chamber to effect mixing (e.g., rotation) is not considered relative motion as used herein.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 30+, for dynamic charge means.
 33+, for similar devices combined with dynamic charge means.
- 42 With dynamic delivery:**
 This subclass is indented under subclass 1. Subject matter including (1) means movable to remove mixed material from a mixing chamber, or (2) means to move a movably mounted mixing chamber to effect discharge thereof.
- 43 Including automatic control means:**
 This subclass is indented under subclass 42. Subject matter comprising automatic means (1) to directly control the discharging means, or (2) to control the enabling or disabling of devices for manually controlling the discharge means.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 29, for intercontrol of feed and discharge.
- 44 Rotatable mixing chamber reversible for delivery:**
 Subject matter under 42 wherein the mixing chamber effects agitation by rotation and has cooperating means therein to effect delivery when rotated in the direction opposite to that in which agitation is effected.
- 45 Mixing chamber tiltable for delivery:**
 This subclass is indented under subclass 42. Subject matter wherein the mixing chamber is movably mounted so that it may tilt and discharge its contents.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 26, for mixers which are bodily elevated from a loading to a discharging position.
 53, for oscillating mixers which move to an extreme position to dump.
 185, for tilting mixing chamber.
- SEE OR SEARCH CLASS:
 222, Dispensing, subclasses 160+, especially subclass 166 for this type of discharge means in general.
- 46 With stirrer:**
 This subclass is indented under subclass 45. Subject matter wherein the mixing chamber has a stirrer therein.
- 47 Hand operated tilt:**
 This subclass is indented under subclass 45. Subject matter wherein the mixing chamber has means associated therewith enabling the operator to tilt the chamber by hand.
- (1) Note. Included in this subclass are mixers that have a manual lever or a hand crank for tilting the mixer.
- 48 Wheelbarrow-type support:**
 This subclass is indented under subclass 47. Subject matter wherein the mixing chamber is supported on a frame comprising two elements which have a single ground contacting wheel there between forwardly of the chamber and which extend rearwardly of the chamber to terminate in handle portions.
- 49 Endless belt:**
 This subclass is indented under subclass 42. Subject matter wherein the means to remove the mixed material from the chamber is an endless conveyor.
- 50 Rotary screw:**
 This subclass is indented under subclass 42. Subject matter wherein the means to remove the mixed material from the chamber is a rotatable auger screw conveyor.
- 51 Pump:**
 This subclass is indented under subclass 42. Subject matter wherein the means to remove the mixed material from the chamber is a pump which directly forces or induces material from the mixing chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 50, wherein the pump is a rotary screw.
- 52 Scraper or deflector:**
 This subclass is indented under subclass 42. Subject matter wherein the means for removing material from the mixing chamber is a scraper or a deflector.

- (1) Note. The scraper or deflector is so mounted as to direct material through the discharge opening of the mixer.
- 53 Movable mixing chamber:**
This subclass is indented under subclass 1. Subject matter wherein mixing is effected by movement of the mixing chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
26, for a mixing chamber moved bodily by elevating means which also moves the chamber to effect mixing.
219+, for agitators of general application with a movable mixing chamber.
- 54 Rotatable:**
This subclass is indented under subclass 53. Subject matter wherein the mixing chamber turns about an axis in one direction only.
- (1) Note. Included herein are surface contacting rolling chambers as well as wheel supported chambers wherein rolling contact of the wheels causes rotation of the chamber.
- (2) Note. The placement of a rotatable mixing chamber upon an independently movable platform-type support is not deemed to impart an additional motion to the chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
213+, and 220+, for a rotatable mixing chamber.
- 55 With additional diverse motion:**
This subclass is indented under subclass 54. Subject matter wherein the mixing chamber has a component of motion additional to its rotation.
- (1) Note. Included herein are surface contacting rolling chambers as well as wheel supported chambers wherein rolling contact of the wheels causes rotation of the chamber.
- (2) Note. The placement of a rotatable mixing chamber upon an independently
- movable platform-type support is not deemed to impart an additional motion to the chamber.
- 56 With agitator:**
This subclass is indented under subclass 54. Subject matter wherein the rotatable mixing chamber includes an agitator therein.
- 57 Rigid deflector fixed to chamber wall:**
This subclass is indented under subclass 56. Subject matter wherein the agitator is a non-flexible device secured within the mixing chamber to divert a portion of the material to assist agitation.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
44, for a similar device in which reversal of the direction of rotation causes the deflector to convey the material through a discharge means.
52, for a similar device in which the deflector conveys the material through a discharge means after agitation.
- 58 Compartmental-type chamber:**
This subclass is indented under subclass 57. Subject matter wherein the deflector forms a partition dividing the mixing chamber into a plurality of sections.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
14, for plural distinct mortar mixing chambers.
- 59 Helical:**
This subclass is indented under subclass 57. Subject matter wherein the deflector has a helical configuration.
- 60 With specified actuating or control means:**
This subclass is indented under subclass 54. Subject matter including a particularly described means for effecting rotation of the mixing chamber.
- (1) Note. Mere recitation of "drive means" of "actuating means" for the mixing chamber will not be considered specified actuating means.

- 61 Hydraulic drive or control:**
This subclass is indented under subclass 60. Subject matter wherein the actuating or control means includes a device actuated or controlled by a liquid under pressure.
- 62 With specified support structure:**
This subclass is indented under subclass 54. Subject matter including a particularly described element of structure for supporting the mixing chamber.
- (1) Note. Mere recitation of "support", "support means frame", and the like will not be considered specified support structure.
- 63 Specified rotational mounting:**
This subclass is indented under subclass 62. Subject matter wherein the support structure includes a particularly described element for permitting rotational movement of the chamber about an axis.
- 64 Movable stirrer:**
This subclass is indented under subclass 1. Subject matter comprising a stirrer which has relative motion with respect to a mixing chamber.
- 65 Vertical mixing chamber:**
This subclass is indented under subclass 64. Subject matter wherein the mixing chamber is used in an upright position during agitation.
- (1) Note. The mixing chamber is a tank, cylinder, etc.
- 66 Plural stirrers:**
This subclass is indented under subclass 64. Subject matter having more than one stirrer.
- 67 Including scraper, wiper, or brush:**
This subclass is indented under subclass 64. Subject matter including an element having an edge, or a plurality of bristles movable in contact with or in close proximity to a wall of the chamber for removing material from the wall surface.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
309, for rotatable stirrer including a scraper, wiper, or brush.
- 68 Movable chute:**
This subclass is indented under subclass 1. Subject matter comprising a static conveyor and at least one portion of which is capable of relative motion with respect to a mixing chamber.
- 69 RUBBER OR HEAVY PLASTIC WORKING:**
This subclass is indented under the class definition. Apparatus and method including a mixing chamber and an agitator therein for use in kneading substantially self-sustaining, semi-solid, or heavy plastic material such as clay, dough, gum, plastic, resin, or similar heavy plastic.
- (1) Note. A patent for apparatus or method for mixing ingredients for making a plastic mass and kneading the mass will be placed in this or an indented subclass. However, an apparatus or method for mixing the ingredients without further kneading the mass will be placed in an appropriate subclass elsewhere in this class.
- (2) Note. In regard to the line between Class 241 and Class 366, see search note to Class 366 under Class 241 definition, section 12.
- (3) Note. Kneading is a process to work substantially self-sustaining, semisolid, or heavy plastic material into a uniform mixture by pressing, folding, and stretching.
- SEE OR SEARCH 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.

70 Candy puller type:

This subclass is indented under subclass 69. Subject matter comprising spaced arms mounted for relative motion toward and away from each other whereby said material is kneaded by repeated stretching and recombining of stretched portions.

71 Roll couple and scraper:

This subclass is indented under subclass 69. Subject matter wherein the agitator comprises a pair of rollers for pressing the material therebetween and means for removing said material therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

309+, for a rotatable stirrer including a scraper, wiper, or brush.

SEE OR SEARCH CLASS:

492, Roll or Roller, for a roll, per se, not elsewhere provided for.

72 Roll couple and work handler:

This subclass is indented under subclass 69. Subject matter wherein the agitator comprises a press couple comprises rolls with means to adjust the space between each roll.

SEE OR SEARCH CLASS:

100, Presses, subclasses 155+ for concurrent pressing and conveying apparatus including a roll.

492, Roll or Roller, for a roll, per se, not elsewhere provided for.

73 Roll couple having adjustment means:

This subclass is indented under subclass 69. Subject matter wherein the agitator comprising a press couple comprises rolls with means to adjust the space between each roll.

SEE OR SEARCH CLASS:

100, Processes, subclasses 155+ for concurrent pressing and conveying apparatus including a roll, and subclasses 168+ for roll adjustment.

492, Roll or Roller, for a roll, per se, not elsewhere provided for.

74 Roll traveling within platen:

This subclass is indented under subclass 69. Subject matter wherein the agitator comprises a press couple including a roll coating with the interior of said mixing chamber or receptacle type of platen.

SEE OR SEARCH THIS CLASS, SUBCLASS:

241+, for a mixing means comprising a stirrer with a stationary mixing chamber.

SEE OR SEARCH CLASS:

100, Presses, subclass 156 for a concurrent pressing and conveying apparatus comprising external and internal rolls, and subclass 210 for a roll and platen-type press.

75 With specified vent means:

This subclass is indented under subclass 69. Subject matter including means in said mixing chamber or in a stirrer for releasing gas from said mixing chamber.

76.1 With specified feed means:

This subclass is indented under subclass 69. Subject matter including a particularly described means for conveying or admitting material into said mixing chamber.

- (1) Note. Mere recitation of an opening, inlet port, or feed conduit for the material will not be considered specified feed means. However, any of the following claimed particulars will be considered specified means for this subclass: (a) Means applying positive or negative pressure on material to move it into the chamber (e.g., pump). (b) Conveyor means (e.g., belt, screw, chute). (c) Feed control means (e.g., valve, gate). (d) Structure determining the proportions of different material fed to the chamber. (e) A feed conduit extending into the mixing chamber or in tangential relation to the chamber. (f) A plurality of feeders (conduits, chutes, hoppers, etc.) in a particular relation to each other and/or to the mixing chamber. (g) A supply reservoir

and means to feed material from the reservoir into the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

150.1, for general purpose mixing apparatus having specified feed means.

SEE OR SEARCH CLASS:

222, Dispensing, appropriate subclasses, for material dispensing apparatus, per se. See References to Other Classes in the class definition of this class (366) for the line between Class 366 and Class 222.

76.2 Condition responsive:

This subclass is indented under subclass 76.1. Subject matter including a detector for sensing a variable condition of the apparatus or of the material and means for initiating or modifying the movement of material into the mixing chamber in response to a signal from the detector.

SEE OR SEARCH THIS CLASS, SUBCLASS:

151.1+, for condition responsive means in general purpose mixing apparatus.

76.3 Screw feeder distinct from agitator:

This subclass is indented under subclass 76.1. Subject matter wherein the means for conveying or admitting material is a continuous helical blade which is rotated about its longitudinal axis and is clearly distinguishable in function and structure from the agitator in the mixing chamber

SEE OR SEARCH THIS CLASS, SUBCLASS:

35, 38, and 50, for a mortar mixer having a screw conveyor for feeding material to or discharging material from a mixing chamber.

133, and 156.1+, for a mixing apparatus in which material is fed into a mixing chamber by a screw conveyor.

76.4 Plural screws:

This subclass is indented under subclass 76.3. Subject matter wherein the means for conveying comprises more than one rotary helical blade.

(1) Note. There may be a single feeder with plural screws or plural feeders each of which has a screw.

SEE OR SEARCH THIS CLASS, SUBCLASS:

156.2, for a similar feed means for materials other than rubber or heavy plastic in which material is fed into a mixing chamber by a plurality of screw conveyors.

76.5 Roller feeder:

This subclass is indented under subclass 76.1. Subject matter wherein the conveying or admitting means has an elongated member which is rotated to feed material to the mixing chamber.

76.6 Plural feed means:

This subclass is indented under subclass 76.1. Subject matter including a plurality of means for conveying or admitting material into the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

177.1+, for mixing apparatus of general utility having plural feed means.

76.7 Piston feeder (e.g., ram):

This subclass is indented under subclass 76.1. Subject matter including a member movable along a straight path in the direction of feed of material to move the material into the mixing chamber.

76.8 Mixing rotor having recess for material:

This subclass is indented under subclass 76.7. Subject matter wherein the agitator comprises a rotor having a recess or pocket (e.g., a blind bore) for receiving the material.

76.9 Chute or hopper with gravity discharge:

This subclass is indented under subclass 76.1. Subject matter wherein material is supplied to the mixing chamber solely by gravity by way of a chute or hopper.

(1) Note. A hopper is a funnel shaped container, usually, but not necessarily used for dispensing solids. A chute is an open-

topped channel or conduit for guiding material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 41, for a movable charge hopper or chute for a mortar mixer.
- 68, for a movable chute for a mortar mixer.
- 181.1, for a mixing apparatus of general utility having plural feeders including a chute or hopper with gravity discharge to a mixing chamber.
- 183.1, for mixing apparatus including a static conveyor with gravity discharge to a mixing chamber.

76.91 Having plural means to feed material to chute or hopper:

This subclass is indented under subclass 76.9. Subject matter including plural means to feed material to the hopper or chute.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 177.1+, for a mixing apparatus including plural means for feeding material to a mixing chamber.

76.92 Having discharge valve:

This subclass is indented under subclass 76.9. Subject matter including a gate or closure for controlling release of material from the chute or hopper.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 181.3, for a hopper having a gate or valve in an outlet thereof.
- 182.3, for a container with a valved outlet.

76.93 Including specific structure for controlling flow through the feed means:

This subclass is indented under subclass 76.1. Subject matter including particularly described means to start, stop, or regulate the flow of material in the feed means.

- (1) Note. More than the mere recitation of a valve or pump is required for placement of a patent in this subclass. There must be a claim of valve details, a valve operator mechanism, pump feed rate adjustment means, or other feature directly

related to adjustment or control of the material flow rate.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 160.1, through 160.5, for apparatus including mixing ratio control means.
- 165.4, for feed means including a flow regulator in a mixing apparatus in which material has rotary motion.
- 182.1+, for feed means including details of means for controlling flow through the feed means.

77 With specified discharge means:

This subclass is indented under subclass 69. Subject matter including a particularly described means for conveying or releasing said material from said mixing chamber.

- (1) Note. Mere recitation of an opening, outlet port, or discharge conduit for the material will not be considered specified discharge means. However, any of the following claimed particulars will be considered as specified means for this subclass: (a) Means applying pressure on the material to move it out of the chamber (e.g., pump). (b) Conveyor means (e.g., belt, chute, screw). (c) Discharge control means (e.g., valve gate).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 184+, for discharge means of general application.

78 Rotating and reciprocating stirrer:

This subclass is indented under subclass 69. Subject matter including a stirrer which turns in but one direction about a fixed axis and moves back and forth in a straight line along said fixed axis simultaneously or alternately to produce mixing and kneading.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 241+, for rotating and reciprocating stirrer within stationary mixing chamber of general utility.

- 79 Stirrer is through-pass screw conveyor:**
This subclass is indented under subclass 69. Subject matter wherein the mixing chamber is designed to receive material at one end of a path and to discharge it at the other end in a continuous flow, and said agitator comprises a stirrer having a helical ribbon or thread type conveyor rotatable so as to mix and knead the material concurrent with conveying it through said path.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
318+, for screw-type stirrer within a stationary mixing chamber.
- SEE OR SEARCH CLASS:
100, Presses, subclasses 144+ for a concurrent pressing and conveying apparatus of general application. See the search notes in Class 100, subclass 144.
198, Conveyors: Power-Driven, subclasses 657+ for a conveying element of the screw type.
415, Rotary, Kinetic Fluid Motors or Pumps, subclasses 72+ for a pump including a rotary screw.
- 80 With deflector:**
This subclass is indented under subclass 79. Subject matter including a device secured within and in fixed relation to said mixing chamber for assisting said conveyor in mixing and kneading.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
336+, for stationary deflector in flow-through mixing chamber of general utility.
- 81 With additional stirrer element on screw conveyor:**
This subclass is indented under subclass 79. Subject matter wherein said conveyor includes an additional element on the ribbon or thread (e.g., pin, blade, rib) to assist mixing and kneading.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
319, for screw-type stirrer with additional agitator on screw within a mixing chamber of general utility.
- 82 Ring or disk:**
This subclass is indented under subclass 81. Subject matter wherein the additional stirrer element comprises an annulus integral with or affixed to the shaft of said conveyor.
- (1) Note. The ring or disk may be apertured, grooved, or may have other outer surface configuration.
- 83 Plural screw conveyors on separate shafts:**
This subclass is indented under subclass 9. Subject matter comprising separate shafts for distinct helical ribbon or thread-type conveyors.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
292+, for plural stirrers within a stationary mixing chamber of general utility.
- 84 In parallel intercommunicating mixing chambers:**
This subclass is indented under subclass 83. Subject matter wherein said conveyors are located within a plurality of mixing chambers having main axes parallel to each other and each mixing chamber is in communication with each other so that material may flow from one mixing chamber to another.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
290, for stirrer in at least one of intercommunicating adjacent mixing chambers having general utility.
301, for kneaders in plural chambers.
- 85 Screw conveyors intermeshing:**
This subclass is indented under subclass 84. Subject matter wherein one of said conveyors has a profile which contacts a mating surface of parallel screw conveyor along the length thereof.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
301, for parallel stirrers intermeshing with each other in a mixing chamber of general utility.
- 86 Intercommunication by conduit:**
This subclass is indented under subclass 84. Subject matter wherein the communication between each mixing chamber is by means of an elongated, hollow tube.
- 87 And downstream breaker plate or screen:**
This subclass is indented under subclass 79. Subject matter including foraminous means (e.g., grate, lattice, screen, etc.) located at the discharge end of said conveyor.
- 88 Including sections of different pitch:**
This subclass is indented under subclass 79. Subject matter wherein the spacing of thread or helical ribbon on a portion of said conveyor differs from the spacing of said thread or said helical ribbon on another portion.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
321, screw-type stirrer with opposite pitch in a mixing chamber of general utility.
323, screw-type stirrer with varying pitch in a mixing chamber of general utility.
- 89 Varying diameter of shaft:**
This subclass is indented under subclass 79. Subject matter wherein the diameter of a portion of the shaft of said conveyor differs from the diameter of the shaft on another portion.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
323, for screw-type stirrer with varying convolutions or shank or varying pitch in a mixing chamber of general utility.
- 90 Notched, apertured, or interrupted thread:**
This subclass is indented under subclass 79. Subject matter wherein said thread or said helical ribbon has an opening therethrough or a discontinuous portion thereon.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
322, for discontinuous screw stirrers in a mixing chamber of general utility.
324, for screw-type stirrer with apertured or notched threads in a mixing chamber of general utility.
- 91 Plural mixing chambers:**
This subclass is indented under subclass 69. Subject matter wherein said material is kneaded within a plurality of mixing chambers.
- (1) Note. Mixing chambers which are in communication with each other so that material may flow from one chamber to another will be placed in this subclass. Moreover, the communication may be by means of a conduit, or through a conduit, or through or across a portion separating the chambers.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
290+, for stirrer within at least one of intercommunicating adjacent mixing chambers of general utility.
- 92 With means to move mixing chamber:**
This subclass is indented under subclass 69. Subject matter including a particularly described means for moving said mixing chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
130, for an operator supported mixing chamber of general utility.
197+, for a mixing chamber of general utility removable from stirrer and support.
208+, for agitation by movement of support for a mixing chamber of general utility.
219+, for agitation by movement relative to a stationary support of a mixing chamber having general utility.
- 93 Rotating mixing chamber:**
This subclass is indented under subclass 92. Subject matter wherein said mixing chamber turns in but one direction about its own axis.

- flexible so that portions thereof move relative to each other during agitation.
- 94 With rotating stirrer:**
This subclass is indented under subclass 93. Subject matter including a stirrer which turns in but one direction about a fixed axis within said rotating mixing chamber.
- 95 Single stirrer:**
This subclass is indented under subclass 94. Subject matter wherein only one rotating stirrer is within said rotating mixing chamber.
- (1) Note. Where a plurality of like or diverse stirrer elements are in fixed relation to each other and move together as a unit they will be considered as single stirrer even if the elements are adjustable relative to flexible so that portions thereof move relative to each other during agitation.
- 96 Stationary mixing chamber:**
This subclass is indented under subclass 69. Subject matter wherein said mixing chamber is in a fixed position during kneading.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
241+, for stirrer within stationary chamber for general application.
- 97 With rotating stirrer:**
This subclass is indented under subclass 96. Subject matter comprising a stirrer which turns in but one direction about a fixed axis within said stationary mixing chamber.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
279+, for a rotatable stirrer in a fixed mixing chamber with general utility.
- 98 Single stirrer:**
This subclass is indented under subclass 97. Subject matter wherein only one rotating stirrer is within said stationary mixing chamber.
- (1) Note. Where a plurality of like or diverse stirrer elements are in fixed relation to each other and move together as a unit they will be considered a single stirrer even if the elements are adjustable relative to each other prior to agitation or are
- 99 Horizontal:**
This subclass is indented under subclass 98. Subject matter wherein the axis of said rotating single stirrer is horizontal.
- 100 Stirrer with specified drive means:**
This subclass is indented under subclass 69. Subject matter wherein the mixing chamber includes a stirrer and a particularly described means for drive said stirrer to mix and knead.
- (1) Note. Mere recitation of a motor would not be considered as specified drive means.
- 101 BY INJECTING GAS INTO MIXING CHAMBER:**
This subclass is indented under the class definition. Apparatus and corresponding methods wherein the agitation is effected by the introduction of a gas under pressure into contact with the material in the mixing chamber.
- (1) Note. The injection of gas into a liquid must be primarily for agitating the liquid. If the primary purpose is to mix the gas with the liquid, placement will be in Class 261, and see note to that class below.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
163.1+, for a device wherein material, which may include air, is fed into the mixing chamber by suction.
- SEE OR SEARCH CLASS:
222, Dispensing, subclass 195 for dispensing combined with gas agitation.
239, Fluid Sprinkling, Spraying, and Diffusing, subclass 143 for gas effected agitation of supply for a fluid sprinkling or spraying device, and subclasses 654+ for gas effected agitation of supply for nonfluid material sprinkling or spraying device.
261, Gas and Liquid Contact Apparatus, appropriate subclasses for apparatus for mixing a liquid with a gas.

- 406, Conveyors: Fluid Current, subclass 88, 90+, and 136+ for agitation of a solid material in a receptacle by injecting gas into the receptacle.
- 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 10+ for foam colloid systems 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.
- 102 With stirrer:**
This subclass is indented under subclass 101. Subject matter which also includes a stirrer in the chamber.
- 103 Plural stirrers:**
This subclass is indented under subclass 102. Subject matter wherein there is more than one stirrer.
- 104 Diverse:**
This subclass is indented under subclass 103. Subject matter wherein one stirrer differs in structure from another stirrer.
- 105 Into rotating mixing chamber:**
This subclass is indented under subclass 101. Subject matter wherein the chamber is rotatable and the gas is injected into the chamber while it is rotating.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
219+, for a chamber which is rotatable and has additional motion.
220+, for a rotatable mixing chamber.
- 106 Intermittent or pulsating feed:**
This subclass is indented under subclass 101. Subject matter wherein the gas is introduced in recurrent interrupted sequence or in recurrent variation in flow rate.
- 107 Plural gas feeders:**
This subclass is indented under subclass 101. Subject matter wherein the gas is introduced into the chamber through more than one feeder.
- 108 BY VIBRATION:**
This subclass is indented under the class definition. Apparatus and corresponding methods wherein the agitation of the material is effected by the action of a vibratory device producing rapid to and from movement of portions of the material, of the mixing chamber, of a portion of the chamber well or of a stirrer, or by rapid to and from movement of a stirrer energized by flow of the material there against.
- (1) Note. A patent for vibratory device, per se, disclosed for use as a stirrer by insertion with a mass of material will be placed in subclasses 117+ below, and see the search notes thereto.
- SEE OR SEARCH CLASS:
134, Cleaning and Liquid Contact With Solids, subclass 1 for a method of cleaning articles by vibration.
222, Dispensing, subclasses 196+ for dispensing combined with agitation by vibration.
414, Material or Article Handling, subclass 683 for a device for loading a concrete mixer, which device includes means for swinging it in a vertical plane.
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically supe-

rior provision in the USPC for the specifically claimed art.

109 Including endless conveyor:

This subclass is indented under subclass 108. Subject matter including an endless means (e.g., belt, chain, rotary turret) for moving the material, or a mixing chamber containing the material through a zone where the agitation takes place.

110 Of holder for mixing chamber:

This subclass is indented under subclass 108. Subject matter wherein the vibrator device is attached to a receptacle or clasp for the mixing chamber, and wherein the vibration of the mixing chamber results from the operation of the vibratory device.

- (1) Note. For proper placement of a patent in this subclass, the mixing chamber does not have to be claimed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

197+, for a device wherein the mixing chamber is removable from a stirrer and its support.

208+, for agitation by mechanical movement of a support for a removable mixing chamber.

219+, for agitation of material by mechanical movement of a mixing chamber relative to a stationary support.

111 Of platform or mixing chamber supported by vibrator:

This subclass is indented under subclass 108. Subject matter wherein the vibratory device directly supports the mixing chamber or a platform for supporting the mixing chamber.

- (1) Note. For proper placement of a patent in this subclass, the mixing chamber does not have to be claimed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

114, for a device wherein a platform for the mixing chamber is attached to the vibratory device.

197+, for a device wherein the mixing chamber is removable mixing chamber.

219+, for agitation of material by mechanical movement of a mixing chamber relative to a stationary support.

112 Supported by vibrator solely:

This subclass is indented under subclass 111. Subject matter wherein the platform of the mixing chamber is supported solely by the vibratory device.

113 Vibrator mounted in aperture of mixing chamber bottom wall:

This subclass is indented under subclass 108. Subject matter wherein the vibratory device is secured in an opening in the bottom wall of the mixing chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

197+, for a mixing chamber removable from the stirrer and its support.

208+, for agitation by mechanical movement of a support for the mixing chamber.

219+, for agitation of material by mechanical movement of a mixing chamber relative to a stationary support.

114 Vibrator attached to mixing chamber wall or platform:

This subclass is indented under subclass 108. Subject matter wherein the vibratory device is fastened to the mixing chamber wall or to platform adapted to support the mixing chamber.

- (1) Note. For proper placement of a patent in this subclass, the mixing chamber does not have to be claimed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

111, for a device wherein a platform for the mixing chamber is merely supported by the vibratory device.

115 By bonding:

This subclass is indented under subclass 114. Subject matter wherein the vibratory device is adhered or welded to the mixing chamber wall or to the platform.

116 With amplitude or frequency regulator:

This subclass is indented under subclass 108. Subject matter including means for regulating or controlling the amplitude or frequency of the vibration.

- (1) Note. Mere recitation of a switch with no particularly described means for regulating the frequency or the amplitude of the vibration is not sufficient for placement of a patent in this subclass.

117 Of stirrer:

This subclass is indented under subclass 108. Subject matter wherein the agitation of the material is effected by a stirrer activated by a vibratory device, or wherein the stirrer is a vibratory device acting directly on the material.

- (1) Note. A patent for a vibratory device, per se, disclosed for use as a stirrer by insertion within a mass of material will be placed in this or an appropriate indented subclass.

SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, subclasses 20 through 110 for a mechanical vibrator, per se.
173, Tool Driving or Impacting, appropriate subclass for the combination of a toll and a tool driving or impacting means which combination is not limited to a specific tool art, such as specific shape of the work contacting portion of the tool, related tools, or an opposed work support.
310, Electrical Generator or Motor Structure, subclasses 328+ for piezoelectric vibrators.

118 In mixing chamber:

This subclass is indented under subclass 117. Subject matter wherein the stirrer is within a mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 243, for an oscillatable stirrer mounted in a removable closure of a stationary mixing chamber.
276, for an oscillatable stirrer within a stationary mixing chamber.

119 Actuated by flow of material:

This subclass is indented under subclass 118. Subject matter wherein the flow of the material thereagainst as it is fed into the mixing chamber.

120 Pencil type:

This subclass is indented under subclass 117. Subject matter wherein the stirrer comprises an elongated slender housing enclosing the vibratory device and which is intended for insertion manually into the material by the user.

121 With lubricating means:

This subclass is indented under subclass 120. Subject matter including means to lubricate the moving parts in the stirrer.

122 Specified end structure:

This subclass is indented under subclass 120. Subject matter including structure mounted at either end of the stirrer (e.g., nose cap, handle, etc.).

123 Actuated by rotary movement of unbalanced-weight shaft:

This subclass is indented under subclass 120. Subject matter wherein the vibration of the stirrer is caused by the unbalanced weight which is mounted eccentrically on a rotatable shaft.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 128, for a general type of vibrator actuated by rotary movement of unbalanced-weight shaft.

SEE OR SEARCH CLASS:

- 173, Tool Driving or Impacting, subclass 49 for a drive means for a tool as provided for in that class which includes a rotating eccentric mass.

124 Vibrator actuated by fluid under pressure:

This subclass is indented under subclass 108. Subject matter wherein the vibratory device causes vibration of the material or of a portion of the chamber wall, the vibration of the device being caused by the flow of fluid under pressure within the device.

125 Including shaft with radially movable element:

This subclass is indented under subclass 124. Subject matter wherein the vibratory device comprises a shaft, a cylindrical housing for the shaft, and a radially movable element (e.g., blade, vane, ball, pin) on said shaft, the fluid acting on the element or the housing to cause eccentric rotation of the shaft or orbital movement of the housing relative to the shaft and thus causing vibration of the housing.

126 Fluid acting on orbital rolling ball:

This subclass is indented under subclass 124. Subject matter wherein the vibratory device comprises a sphere guided for rolling movement along a generally circular or elliptical path by pressure of the fluid thereagainst, the movement of the sphere causing the vibration of the device.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

125, for a device wherein a ball is movable radially with respect to a shaft within a cylindrical housing.

127 By electrostrictive or magnetostrictive transducer:

This subclass is indented under subclass 108. Subject matter wherein the vibration is caused by periodic deformation of a dielectric body as the result of an applied electric or magnetic field.

128 By rotary movement of unbalanced-weight shaft:

This subclass is indented under subclass 108. Subject matter wherein the vibration of the device is caused by movement of an unbalanced weight which is mounted eccentrically on a rotatable shaft.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

120, for a similar device of the pencil type.

129 OPERATOR SUPPORTED:

This subclass is indented under the class definition. Apparatus and corresponding methods comprising a stirrer and/or mixing chamber which is entirely sustained against the force of gravity by the user during agitation.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

117+, for an operator supported vibratory stirrer.

130 Mixing chamber type:

This subclass is indented under subclass 129. Subject matter wherein a mixing chamber is so held by the user.

(1) Note. Included in this subclass are patents for receptacles with internal deflector structure wherein the agitation is effected by manual manipulation of the receptacle as a whole by the user.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

110, for an apparatus including a holder for a chamber and means to cause vibration of the holder to effect agitation of material in the chamber.

209+, for apparatus including means to secure a chamber to a movable support and means to move the support to effect agitation of material in the chamber.

SEE OR SEARCH CLASS:

206, Special Receptacle or Package, subclasses 219+ for a package of two or more separated materials which are adapted to be commingled within the package by manipulation of the package or a part thereof.

220, Receptacles, appropriate subclasses for receptacle without deflectors and which are disclosed to be manipulated for agitation.

131 HAVING INTERRELATED FEED AND DISCHARGE MEANS:

This subclass is indented under the class definition. Apparatus and corresponding methods including external means to convey or admit material into the mixing chamber and means to convey or release the material therefrom and wherein said means: (a) are interconnected by a duct or conveyor exteriorly of the chamber for returning discharge material to the chamber; (b) have a common control system for regulating movement of material into and out of the chamber. (c) have a single mechanism for mov-

- ing the material into and out of the chamber, or (d) are specifically related to each other by their relative size.
- (1) Note. The feed and discharge may be through a common opening.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
76.3, for a screw conveyor for feeding material into a rubber or heavy plastic working apparatus.
139, for a device including means to produce a partial vacuum in the mixing chamber which means may also serve to move material into and/or out of the chamber.
- 132 Including means to monitor or control operation:**
This subclass is indented under subclass 131. Subject matter including a common control system for regulating movement of material into and out of the chamber, and also including a detector for sensing a variable condition of the apparatus or of the material and initiating or modifying operation of a part of the apparatus in response to signal from the detector.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
151.1, for an apparatus wherein the feed means is responsive to a condition-sensor.
- 133 By single endless or screw conveyor:**
This subclass is indented under subclass 131. Subject matter wherein a single endless or screw conveyor serves to either move material into and out of the chamber or to return discharged material to the mixing chamber.
- 134 Plural feed or discharge means:**
This subclass is indented under subclass 131. Subject matter wherein there is more than one feed or discharge means in a particular relation to each other and/or to the mixing chamber.
- 135 Rotatable mixing chamber:**
This subclass is indented under subclass 131. Subject matter wherein the agitation takes place in a mixing chamber that rotates in one direction only.
- 136 Recirculating from and to mixing chamber:**
This subclass is indented under subclass 131. Subject matter wherein the feed and discharge means are interconnected by a duct exteriorly of the mixing chamber for returning at least a portion of discharge material to the chamber.
- 137 Directly:**
This subclass is indented under subclass 136. Subject matter wherein the discharge material is returned without interruption to the mixing chamber.
- 137.1 JET OR SPRAY IMPINGING FREE-FALLING STREAM:**
This subclass is indented under the class definition. Subject matter wherein material is mixed by directing a jet or spray of one material into contact with a free-falling stream of another material so as to intermix the material of the jet and the stream.

(1) Note. The free-falling stream of material may be solid or liquid. The material is considered free-falling if it is unconfined or substantially uninfluenced in its motion by any adjacent surfaces or the like during its fall through a gas.
- 138 WITH FLUSHING OF MIXING CHAMBER:**
This subclass is indented under the class definition. Apparatus and corresponding methods provided with means, in addition to inlet and outlet means for the material to be agitated, for introducing a cleansing fluid into the mixing chamber.
- 139 IN VACUUM CHAMBER:**
This subclass is indented under the class definition. Apparatus and corresponding methods including means for producing a partial vacuum in the mixing chamber during agitation.

(1) Note. Substantially the entire contents of the mixing chamber must be under reduced (subatmospheric) pressure. Where the contents are not and localized vacuum or suction is created to feed material into the chamber, placement is as indicated in the search notes below.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
163.1+, for a device provided with suction means for feeding material into the mixing chamber.
- 140 WITH SAMPLING:**
This subclass is indented under the class definition. Apparatus and corresponding methods including means for or a step of segregating or removing a portion of the material for the purpose of inspection examination, or testing.
- 141 WITH WEIGHING:**
This subclass is indented under the class definition. Apparatus and corresponding methods including means for or a step of determining the weight of a segregated quantity of material.
- 142 WITH TEST, SIGNAL, OR INDICATOR MEANS:**
This subclass is indented under the class definition. Apparatus and corresponding methods with means for (a) determining a property or characteristic of the material for the purpose of indicating the property or (b) producing or providing a perceptible manifestation (e.g., audible or visible) of a condition of a part of the apparatus or of a condition or rate of flow of the material.
- (1) Note. If feeding of material is automatically controlled by or in response to the determining means, placement is as indicated in the search notes below.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
151.1+, for mixing apparatus having feed means responsive to a condition sensor.
- 143 WITH INSPECTION MEANS (E.G., WINDOW):**
This subclass is indented under the class definition. Apparatus and corresponding methods including means for viewing a part of the apparatus or a portion of the material.
- 144 WITH HEATING OR COOLING:**
This subclass is indented under the class definition. Apparatus and corresponding methods including means for modifying the temperature of the material.
- (1) Note. The temperature modification may occur before, during, or after agitation.
- (2) Note. See the class definition for class lines with other heating or cooling classes.
- SEE OR SEARCH CLASS:
99, Foods and Beverages: Apparatus, subclass 348 for a cooking apparatus combined with means to stir material while it is cooking.
126, Stoves and Furnaces, subclass 387.1 for an open-top liquid heating vessel that may include a lid having an agitator or circulator using the heated liquid within the vessel.
- 145 Including temperature control:**
This subclass is indented under subclass 144. Subject matter including means for regulating the temperature.
- 146 Electrical heating:**
This subclass is indented under subclass 144. Subject matter wherein the material is heated by means of an electric current moving through a resistance element.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
145, for electrical heating combined with a temperature control.
- SEE OR SEARCH CLASS:
219, Electric Heating, subclasses 296+ for an electric heating apparatus for a liquid with means to circulate the liquid in a fixed path in relation to a heated surface so as to transfer heat to the liquid. Where electrical heating means is only broadly claimed, placement will be in Class 366; but where details of the heater or control means for the heater are claimed, placement will be in Class 219.

- 147 Medium in stirrer or mixing chamber:**
This subclass is indented under subclass 144. Subject matter wherein the temperature modifying means includes means for circulating a heated or cooled fluid (e.g., gas, water) in the stirrer or for admitting such fluid in to the chamber.
- 148 Of supply:**
This subclass is indented under subclass 144. Subject matter wherein the temperature modification of the material is effected prior to its entry into the mixing chamber.
- 149 Fluid-filled jacket:**
This subclass is indented under subclass 144. Subject matter including wall structure surrounding the mixing chamber in spaced relation to provide a cavity for a fluid heating or cooling medium.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
144, for a device including a heating or cooling conduit coiled about the mixing chamber.
204, for a container which supports a mixing chamber and where a cooling means can be placed in the container.
- 150.1 HAVING SPECIFIED FEED MEANS:**
This subclass is indented under the class definition. An apparatus or corresponding method including a particularly described means for conveying or admitting material (i.e., feed means) into the mixing chamber.
- (1) Note. Mere recitation of an opening, inlet port, or feed conduit for the material is not considered specified feed means. However, any of the following claimed particulars are considered specified means for this subclass: (a) means applying positive or negative pressure on material to move it into the chamber (e.g., pump); (b) conveyor means (e.g., belt, screw, chute); (c) feed control means (e.g., valve, gate); (d) structure determining the proportions of different materials fed to the chamber; (e) a feed conduit extending into the mixing chamber or in tangential relation to the chamber; (f) a plurality of feed means (conduits, chutes, hoppers, etc.) in a particular relation to each other or to the mixing chamber; or (g) a supply reservoir and means to feed material from the reservoir into the chamber.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
27+, 30+, and 40, for a mortar mixer type apparatus having means for feeding material into a mixing chamber.
76, for a rubber or heavy plastic working apparatus having specified feed means.
131, for a device wherein the feed means and the discharge means are interrelated.
- SEE OR SEARCH CLASS:
222, Dispensing, appropriate subclasses, for material dispensing apparatus, per se. See References to Other Classes in the Class definition of this class (366) for the line between Class 366 and Class 222.
- 151.1 Responsive to condition sensor:**
This subclass is indented under subclass 150.1. Subject matter including a detector for sensing a variable condition of the apparatus or of the material and means for initiating or modifying the movement of material into the mixing chamber in response to a signal from the detector.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
76.2, for condition responsive feed means in a rubber or heavy plastic working apparatus.
132, for an apparatus including interrelated feed and discharge means and a sensor to monitor and control its operation.
141, for a mixing apparatus including a detector for sensing weight, which may include a weight-responsive control.
- 151.2 Responsive to location of mixing chamber:**
This subclass is indented under subclass 151.1. Subject matter wherein the sensor is responsive to the position of the mixing chamber.

152.1 Proportioning plural material components:
This subclass is indented under subclass 151.1. Subject matter wherein the mixing chamber has feed means for different materials, the means for initiating or modifying movement of the material controlling at least one of the feed means so as to control or maintain the ratio of the materials admitted into the mixing chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 8, and 16+, for a mortar mixing method or mortar mixer type apparatus involving proportioning of plural ingredients.
- 160.1+, for specified feed means with mixing ratio control not dependent on sensing means.
- 162.1+, for specified feed means providing a fixed, predetermined mixing ratio.

152.2 By volume or fixed quantity:
This subclass is indented under subclass 152.1. Subject matter wherein (a) the variable condition sensed by the detector is a volume or specific quantity of material fed by one of the feed means and (b) the detector senses the condition by monitoring the feed means.

- (1) Note. The specific quantity of material to be fed may be determined by the operation of a pump of known capacity for a given time period.

152.3 By viscosity:
This subclass is indented under subclass 152.1. Subject matter wherein the detector senses resistance to the movement of an object through the material being mixed.

152.4 By electrical conductivity:
This subclass is indented under subclass 152.1. Subject matter wherein the detector senses the electrical conductivity of the material being mixed.

152.5 Responsive to viscosity:
This subclass is indented under subclass 151.1. Subject matter wherein the detector senses resistance to the movement of an object through the material being mixed.

152.6 Responsive to level of material in feeder:
This subclass is indented under subclass 151.1. Subject matter wherein the detector senses the level of material in the feed means.

153.1 Controlling level of material in mixing chamber:
This subclass is indented under subclass 151.1. Subject matter wherein the detector senses the level of material in the chamber.

SEE OR SEARCH CLASS:

- 222, Dispensing, subclass 56 and 64+ for feed means controlled by the level of material in a receiving chamber.

153.2 Layering:
This subclass is indented under subclass 150.1. Subject matter wherein the feed means deposits the material in the mixing chamber in layers and the material is subsequently removed from the mixing chamber such that portions of each layer are substantially simultaneously removed, thereby mixing the material.

153.3 Endless conveyor:
This subclass is indented under subclass 150.1. Subject matter including an endless conveyor for feeding the material to the mixing chamber.

- (1) Note. The endless conveyor may be, for example, an endless belt or an endless chain carrying material-transporting buckets.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 49, for an endless belt for discharging material from a mortar mixer type apparatus.
- 133, for agitating apparatus having interrelated feed and discharge means including an endless or screw conveyor.

SEE OR SEARCH CLASS:

- 198, Conveyors: Power Driven, appropriate subclasses for endless belt conveyors.

154.1 Agitation of material in feeder or supply reservoir:

This subclass is indented under subclass 150.1. Subject matter including means for agitating the material in the feed means or in a supply container operatively associated with the feed means.

- (1) Note. The agitation may be for the purpose of moving the material toward the chamber or merely for preventing agglomeration of the material so as to maintain its free flow. The recitation of a screw conveyor or other feed means that inherently agitates material is sufficient to make placement of a patent here proper. A trap chamber feeder is not considered to inherently agitate material as required for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

290, for plural intercommunicating stationary mixing chambers having a stirrer in each chamber.

154.2 By vibration:

This subclass is indented under subclass 154.1. Subject matter wherein the means for agitating the material in the feed means includes a vibrating element.

- (1) Note. The vibrating element may be part of the feed means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

31, for a mortar mixer having a vibrator element in the path conducting material to a mixing chamber.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclass 533 for gravity conveyors having means to affect flow of conveyed material by vibration.

222, Dispensing, subclasses 196+ for a container and means for vibrating the container or portion thereof to assist gravity discharge of material from the container.

155.1 Rotatable impeller:

This subclass is indented under subclass 154.1. Subject matter wherein the agitator comprises a stirrer that agitates the material by turning about an axis.

155.2 Having radially projecting pinlike element:

This subclass is indented under subclass 155.1. Subject matter wherein the stirrer includes an element that (a) is elongated in the radial direction of the shaft, (b) has a substantially constant cross section perpendicular to its longitudinal axis whose thickness is similar in all directions, and (c) has a free radially outer end.

156.1 Screw conveyor:

This subclass is indented under subclass 155.1. Subject matter wherein the rotatable impeller comprises structure having a continuous helical blade which rotates about its longitudinal axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

35, 38, and 50, for mortar mixer type apparatus having screw conveyors for feeding or discharging material from a mixing chamber.

76.3, for a screw conveyor for feeding material into a rubber or heavy plastic working apparatus.

133, for mixing apparatus in which material is moved into and out of a mixing chamber by a single screw conveyor.

156.2 Plural screw feeders:

This subclass is indented under subclass 156.1. Subject matter wherein there is more than one rotatable impeller structure having a continuous helical blade which rotates about its longitudinal axis in the feed means.

- (1) Note. There may be a single feed means having plural screw feeders or plural feed means each having a screw feeder.

157.1 Coaxial or unitary with stirrer:

This subclass is indented under subclass 156.1. Subject matter wherein (a) the mixing chamber has a stirrer which moves about an axis aligned with the axis of the rotatable impeller or (b) the rotatable impeller extends into the mixing

- chamber to also serve as a stirrer within the chamber.
- 157.2 Screw stirrer:**
This subclass is indented under subclass 157.1. Subject matter wherein (a) the stirrer moving about the axis aligned with the screw conveyor is a screw-type stirrer, or (b) the screw conveyor extends into the mixing chamber to serve as the stirrer.
- 157.3 Vertical axis:**
This subclass is indented under subclass 157.2. Subject matter wherein the axes of the screw conveyor and screw stirrer are vertical during operation.
- 157.4 Vertical axis:**
This subclass is indented under subclass 157.1. Subject matter wherein the axes of the screw conveyor and stirrer are vertical during operation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
157.3, for a mixer including a vertical screw-type stirrer and screw conveyor.
- 158.1 Axis parallel to stirrer in mixing chamber:**
This subclass is indented under subclass 156.1. Subject matter wherein the mixing chamber has a stirrer movable about an axis which is parallel to and noncoaxial with the axis of the screw conveyor.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
157.1, for mixing apparatus having a screw conveyor coaxial or unitary with a stirrer.
- 158.2 Varying diameter screw or shank:**
This subclass is indented under subclass 156.1. Subject matter wherein the helical blade varies in diameter along its length or the blade surrounds and is mounted on a central shank that varies in diameter.
- 158.3 Discontinuous screw:**
This subclass is indented under subclass 156.1. Subject matter wherein the helical blade is interrupted along its length.
- 158.4 Including upstream agitator:**
This subclass is indented under subclass 156.1. Subject matter including an agitator upstream of the helical blade in the direction of flow of material in the feed means.
- 158.5 Stationary deflector:**
This subclass is indented under subclass 154.1. Subject matter wherein the means for agitating the material in the feed means or supply container comprises a stationary deflector configured and arranged to cause irregular flow of material past the deflector.
- 159.1 Returning material to supply:**
This subclass is indented under subclass 150.1. Subject matter including means to cause or permit material fed toward the mixing chamber to move away from the chamber in the feed means before entering the mixing chamber.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
136, for an apparatus including external means for recirculating material from and to the mixing chamber.
- 160.1 Adjustable mixing ratio control:**
This subclass is indented under subclass 150.1. Subject matter wherein the feed means includes variable means for controlling the relative quantities of different materials fed by the feed means to the mixing chamber.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
8, and 16+, for a mortar mixing method or mortar mixer type apparatus involving proportioning of plural ingredients.
152.1+, for a similar device wherein the mixing ratio is controlled by a condition sensor.
162.1+, for means feeding materials to a mixing chamber in a predetermined ratio that is not adjustable.
- 160.2 Including pump:**
This subclass is indented under subclass 160.1. Subject matter wherein the feed means includes a pump for moving or conveying the material to the mixing chamber.

- (1) Note. A "pump" includes a screw- or auger-type feed means for purposes of this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 162.3, for a feed chamber of decreasing volume.
 176.1+, for a mixing apparatus including a pump that forces material through a restriction to agitate it.
 181.8, for plural feeders including a fluid pump.
 182.2, for flow control means including a pump.

160.3 By variable pump:

This subclass is indented under subclass 160.2. Subject matter wherein the variable means comprises means for varying the speed, duration, or capacity of the pump.

160.4 Piston pump:

This subclass is indented under subclass 160.3. Subject matter wherein the pump utilizes a piston to force material out of a housing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 176.3, for a mixing apparatus comprising a piston pump forcing material through a restriction.

160.5 By volume:

This subclass is indented under subclass 160.1. Subject matter wherein the variable means includes means responsive to a volume of material.

- (1) Note. The volume of material must be measured directly; e.g., by filling a container or a piston pump cylinder of known volume.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 19, for mortar mixer type apparatus having means for proportioning ingredients by volume.
 152.2, for feed means including means for measuring the volume of material fed.

162.1 Predetermined mixing ratio:

This subclass is indented under subclass 150.1. Subject matter wherein the feed means is designed to deliver different materials to the mixing chamber in a fixed proportional relationship.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 152.1+, for a similar device wherein the mixing ratio is regulated by a condition sensor.
 160.1+, for means feeding materials in a constant ratio, which ratio can be varied or adjusted.

162.2 Rotatable feeder:

This subclass is indented under subclass 162.1. Subject matter wherein the feed means includes at least one feed means that rotates for feeding material to the mixing chamber.

- (1) Note. Endless conveyors are not considered rotatable feed means. Rotatable feed means include screw conveyors, rotatable trap chambers, etc.

162.3 Feed chamber of decreasing volume:

This subclass is indented under subclass 162.1. Subject matter wherein the feed means has a feed chamber for feeding material to the mixer and the feed chamber decreases in volume during the feeding of material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 160.2+, for a piston pump or other feed means having a variable volume chamber.

162.4 Impinging jets:

This subclass is indented under subclass 150.1. Subject matter wherein the feed means includes a pair of inlets into the mixing chamber constructed to direct material toward a common point and wherein the material is introduced into the chamber through the inlets with sufficient velocity to form streams that collide at the common point and intermix.

- (1) Note. Devices in which the energy of any streams formed by mixing chamber inlet is substantially dissipated before the streams collide are excluded.

SEE OR SEARCH CLASS:

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclass 133 and 135 for chemical reactors forming impinging jets.

162.5 Having clean-out rod:

This subclass is indented under subclass 162.4. Subject matter including a body that reciprocates within the mixing chamber to assist the discharge of the material from the chamber.

163.1 By suction:

This subclass is indented under subclass 150.1. Subject matter wherein the material is moved into the chamber under the influence of negative pressure produced in the chamber.

- (1) Note. This subclass does not require substantially the entire volume of the mixing chamber to be exposed to negative pressure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

139, for a mixing chamber, the entire contents of which is exposed to negative pressure, in which the negative pressure may serve to move material into the mixing chamber.

163.2 By venturi or jet pump type device:

This subclass is indented under subclass 163.1. Subject matter including (a) a passage having a region of reduced cross-sectional area connected to the mixing chamber and constructed so that the flow of a fluid through the region creates the suction, or (b) a small tube through which material is directed into a larger tube with sufficient velocity to produce the suction.

- (1) Note. The passage may constitute a portion of the mixing chamber, or a low pressure region of the passage may be fluidly connected to the mixing chamber.

164.1 By stirrer:

This subclass is indented under subclass 163.1. Subject matter wherein the suction is produced by movement of a stirrer within the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

262+, for a mixing apparatus including a pump creating a reduced pressure to move material through a confined flow path within a mixing chamber.

164.2 Conduit integral with stirrer:

This subclass is indented under subclass 164.1. Subject matter wherein the stirrer is mounted for rotation about a fixed axis and the material is fed by the suction to the chamber through a conduit that is fixed to or part of the stirrer so as to be substantially immovable with respect to the stirrer.

SEE OR SEARCH THIS CLASS, SUBCLASS:

169.1+, for a rotatable stirrer through which material is fed into the mixing chamber.

164.3 Detachably or adjustably mounted on drive shaft:

This subclass is indented under subclass 164.2. Subject matter wherein the stirrer is mounted on and driven by a rotatable drive shaft and the stirrer and at least a portion of the conduit can be repositioned or are removably mounted on the drive shaft.

164.4 Stationary deflector in mixing chamber:

This subclass is indented under subclass 164.3. Subject matter having a fixed deflector in the mixing chamber for providing additional agitation of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

302+, for a stationary element in a mixing chamber cooperating with a rotating stirrer. See the search notes in subclass 302 for other locations of mixing apparatus having stationary agitating elements.

164.5 Outlet behind blade:

This subclass is indented under subclass 164.2. Subject matter wherein the stirrer has a blade and the material-conducting conduit discharges the material into a zone to the rear of the blade.

164.6 Centrifugal type:

This subclass is indented under subclass 164.1. Subject matter wherein the stirrer is rotatable, rotation of the stirrer generating flow of material away from the axis of rotation of the stirrer that creates the negative pressure in the mixing chamber.

- (1) Note. Excluded from this subclass are devices in which all radial motion of fluid is incidental to the operation of the device, that is, not producing the suction drawing material into the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

263+, for a centrifugal pump type mixer for circulating material within a mixing chamber.

165.1 Material introduced so as to cause rotary motion in mixing chamber (e.g., cyclonic):

This subclass is indented under subclass 150.1. Subject matter wherein the feed means is arranged relative to an inner wall of the mixing chamber to cause a generally circular or elliptical movement of the material within the chamber.

165.2 Including deflector in chamber (deflector may be part of chamber wall):

This subclass is indented under subclass 165.1. Subject matter wherein the mixing chamber has a deflector therein positioned to be contacted by either the material entering the chamber or the material undergoing mixing within the chamber.

- (1) Note. The deflector may be part of the mixing chamber wall and extends into the chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

302+, for a stationary element in a mixing chamber cooperating with a rotating stirrer. See the search notes in subclass 302 for other locations of mixing apparatus having stationary agitating elements.

165.3 Rotating stirrer in chamber:

This subclass is indented under subclass 165.1. Subject matter wherein the mixing chamber has a rotatable member therein for further implementing agitation.

- (1) Note. The rotatable member may be driven by a power source such as a motor or driven by means of the material entering the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

279+, for a rotating stirrer in a stationary mixing chamber, per se.

165.4 Feed means having a flow regulator (e.g., valve or pump):

This subclass is indented under subclass 165.1. Subject matter wherein the feed means includes means (e.g., a valve or pump) to control the flow of material into the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

182.1+, for means for controlling flow of material to a mixing chamber.

165.5 Manifold in feed means:

This subclass is indented under subclass 165.1. Subject matter wherein the means supplying the material has a plurality of outlets into the mixing chamber, all of which are connected to a common supply source.

SEE OR SEARCH THIS CLASS, SUBCLASS:

173.2, 178.2, and 181.6, for feed means having plural outlets into a mixing chamber, all connected to the same source of material. See the search notes in subclass 181.6 for further locations of mixing apparatus having plural material feed means or outlets.

166.1 Print washer type:

This subclass is indented under subclass 150.1. Subject matter constructed for washing photos:graphic prints or the like.

SEE OR SEARCH CLASS:

- 134, Cleaning and Liquid Contact With Solids, appropriate subclasses for a print washer with a support for the work.
- 396, Photography, subclasses 564+ for a photos:graphic fluid treating vessel and means to move a film.

167.1 Liquid injector within mixing chamber:

This subclass is indented under subclass 150.1. Subject matter wherein the feed means includes a passage-forming element projecting into the mixing chamber so as to admit liquid material through the element into the chamber.

167.2 Injector is rotatable body having internal material passage and peripheral outlet (e.g., slinger):

This subclass is indented under subclass 167.1. Subject matter wherein the injector comprises a rotating member having an internal chamber or channel through which the material flows and having outlets in its periphery through which material is discharged from the chamber or channel into the mixing chamber.

- (1) Note. A rotating hollow stirrer (i.e., a rotating body agitating material by contact with the exterior surface of the body) through which material is fed is not included in this subclass. See the search notes below for the location of such a device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 169.1+, for a rotatable stirrer having a material-supplying passage therein.

168.1 Including rotating stirrer:

This subclass is indented under subclass 167.1. Subject matter also including a rotatable stirrer in the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 279+, for a rotating stirrer in a mixing chamber.

168.2 Driven by material feed:

This subclass is indented under subclass 168.1. Subject matter wherein the stirrer is rotated by material fed to the mixing chamber.

- (1) Note. Only one of plural feeds need drive the stirrer.

169.1 Fed through stirrer or stirrer drive shaft:

This subclass is indented under subclass 168.1. Subject matter wherein the passage-forming element is an integral part of the stirrer.

- (1) Note. A drive shaft integral with a stirrer is considered a part of the stirrer.
- (2) Note. Typical of patents in this subclass is a stirrer having a drive shaft and having a passage in the shaft through which liquid is fed into the mixing chamber.
- (3) Note. Substantially all of the material that flows through the passage-forming element must be from outside the mixing chamber rather than from the agitated contents of the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 164.2+, for apparatus in which material is fed into a mixing chamber through a stirrer or a conduit integral therewith by suction generated by the stirrer.

169.2 Fed radially through side wall of shaft:

This subclass is indented under subclass 169.1. Subject matter wherein the material is fed radially through a side wall of a drive shaft of the stirrer.

170.1 Rotating mixing chamber:

This subclass is indented under subclass 169.1. Subject matter wherein the mixing chamber is rotatable to effect agitation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 213+, and 220+, for rotating mixing chambers, per se.

170.2 Plural coaxial rotating shafts:

This subclass is indented under subclass 169.1. Subject matter including a rotating shaft coaxial with the axis of rotation of the stirrer.

- (1) Note. The rotating shaft may or may not be the drive shaft for an additional stirrer.

170.3 Passage through stirrer blade:

This subclass is indented under subclass 169.1. Subject matter wherein the passage-forming element is a projection of the stirrer having substantial radial extension from the axis of rotation of the stirrer.

170.4 Stationary feed conduit received within rotating stirrer or shaft:

This subclass is indented under subclass 169.1. Subject matter wherein the feed means includes a stationary conduit having a portion located inside the rotating stirrer.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 175.1, and 175.3, for a liquid injector received in a moving mixing chamber.
183.3+, for a static material conveyor which may extend into a rotating mixing chamber.

171.1 Including cooperating stationary element:

This subclass is indented under subclass 168.1. Subject matter wherein the mixing chamber has an immovable element therein which is in addition to the injector and which cooperates with the rotatable stirrer to effect agitation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 302+, for a stationary element in a mixing chamber cooperating with a rotating stirrer. See the search notes in subclass 302 for other locations of mixing apparatus having stationary agitating elements.

172.1 Plural injectors:

This subclass is indented under subclass 168.1. Subject matter wherein there is more than one passage-forming element in the mixing chamber.

- (1) Note. A branched tube constitutes plural injectors, while a single tube or nozzle having a plurality of perforations without projecting hollow fluid conducting members does not constitute plural injectors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 173.1+, for plural injectors in a mixing chamber not having a rotatable stirrer.
181.6, for feed means having plural identical outlets opening into a mixing chamber all of the outlets being connected to the same source of material. See the search notes in subclass 181.6 for further locations of mixing apparatus having plural material feed means or outlets.

172.2 Injector directs material onto stirrer:

This subclass is indented under subclass 168.1. Subject matter wherein the tube or nozzle directs the material into a region immediately adjacent to the stirrer.

173.1 Plural injectors:

This subclass is indented under subclass 167.1. Subject matter wherein there is more than one passage-forming element in the chamber.

- (1) Note. A branched tube constitutes plural injectors, while a single tube or nozzle having a plurality of perforations without projecting hollow fluid conducting members does not constitute plural injectors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 172.1, for plural injectors in a mixing chamber having a rotatable stirrer.
181.6, for feed means having plural identical outlets opening into a mixing chamber, all of the outlets being connected to the same source of material. See the search notes in subclass 181.6 for further locations of mixing apparatus having plural material feed means or outlets.

173.2 Plural injectors for material from same source:

This subclass is indented under subclass 173.1. Subject matter having plural passage-forming elements in the mixing chamber for material from the same supply.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

165.5, 178.2, and 181.6, for feed means having plural inlets into a mixing chamber connected to a common material source. See the search notes in subclass 181.6 for further locations of mixing apparatus having plural material feed means or outlets.

174.1 Deflector:

This subclass is indented under subclass 167.1. Subject matter which also includes an element that is in the chamber and stationary relative to the chamber or a support therefor serving to divert portions of the material in the mixing chamber so as to assist in the agitation.

- (1) Note. The deflector need not act directly on fluid introduced by the tube or nozzle or a flow induced entirely by the introduction of material through the tube or nozzle, but may act on any moving material in the chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

302+, for a stationary element in a mixing chamber cooperating with a rotating stirrer. See the search notes in subclass 302 for other locations of mixing apparatus having stationary agitating elements.

175.1 Rotating mixing chamber:

This subclass is indented under subclass 174.1. Subject matter wherein the mixing chamber is rotatable about its axis to assist in the agitation.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

170.4, for a stationary feed conduit received within a rotatable stirrer shaft.
175.3, for a stationary liquid injector located in a movable mixing chamber.

183.3+, for a stationary material conveyor feeding material to a rotating mixing chamber.

213+, and 220+, for a rotatable mixing chamber.

175.2 Injector directs material onto deflector:

This subclass is indented under subclass 174.1. Subject matter wherein the passage-forming element directs the material introduced through it onto the stationary element.

175.3 Moving mixing chamber:

This subclass is indented under subclass 167.1. Subject matter wherein the mixing chamber moves to agitate the material therein.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

53+, 208+, and 219+, for moving mixing chambers.

170.1, for a liquid injector in the form of a stirrer in a rotating mixing chamber.

170.4, for a stationary feed conduit received within a rotatable stirrer shaft.

175.1, for a liquid injector received in a rotating mixing chamber.

180.1, for a rotating mixing chamber having plural feed means.

183.3+, for a static material conveyor which may extend into a rotating mixing chamber.

176.1 Pump forces material through restriction (e.g., static emulsifier):

This subclass is indented under subclass 150.1. Subject matter wherein the feed means is in the form of a pump for forcing the material through a narrow restriction for the purpose of mixing the material, particularly for the purpose of emulsifying or homogenizing the material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

160.2+, 181.8, and 182.2, for a mixing chamber having a pump for feeding material to it.

181.5, for a flow-through mixing chamber having a stationary deflector for agitating the material.

336+, and particularly 340, for mixing apparatus in which material is divided into different portions by passage around

deflectors or through apertures therein and recombined for the purpose of mixing or emulsifying the material.

SEE OR SEARCH CLASS:

138, Pipes and Tubular Conduits, subclasses 40+ for a conduit having a restriction that modifies the flow of fluid through the conduit.

516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, appropriate subclasses for subject matter relating to: colloid systems (such as sols*, emulsions, dispersions, foams, aerosols, smokes, gels, or pastes) or wetting agents (such as leveling, penetrating, or spreading); subcombination compositions of colloid systems containing at least an agent specialized and designed for or peculiar to use in making or stabilizing colloid systems; compositions and subcombination compositions specialized and designed for or peculiar to use in breaking (resolving) or inhibiting colloid systems; processes of making the compositions or systems of the class; processes of breaking (resolving) or inhibiting colloid systems; in each instance, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

176.2 Variable restriction (may be manual or pressure responsive):

This subclass is indented under subclass 176.1. Subject matter wherein the size of the restriction can be readily adjusted.

- (1) Note. The size of the narrow restriction may be changed by either a mechanical means or by fluid pressure acting on the walls of the restriction.

SEE OR SEARCH THIS CLASS, SUBCLASS:

182.1+, for means for controlling the flow in a feed means.

176.3 Piston pump:

This subclass is indented under subclass 176.1. Subject matter wherein the pump includes a movable piston that forces the material to move.

SEE OR SEARCH THIS CLASS, SUBCLASS:

160.4, for a mixing apparatus having a piston pump for feeding material to a mixing chamber.

176.4 Adjustable pressure regulator:

This subclass is indented under subclass 176.3. Subject matter wherein the narrow restriction is within a chamber and the pressure within the chamber may be changed by adjustable means for maintaining a desired pressure (e.g., a regulator valve).

177.1 Plural related feeders having separate outlets to mixing chamber:

This subclass is indented under subclass 150.1. Subject matter including a plurality of feed means emptying into the mixing chamber through separate outlets and being in a particular relation to each other or the mixing chamber.

- (1) Note. The mixing chamber that the materials enter must be a chamber in which mixing of the type proper for Class 366 occurs.

SEE OR SEARCH THIS CLASS, SUBCLASS:

33+, for plural feed means in a mortar mixer type apparatus.

107, for plural feed means for introducing agitating gas into a mixing chamber.

134, for plural feed or discharge means in a mixing chamber wherein the feed and discharge means are interrelated.

152.1+, 160.1+, 162.1+, and 162.4+, for mixing apparatus including means for feeding plural materials or material charges into a mixing chamber.

172.1, and 173.1+, for plural injectors in a mixing chamber.

178.1 Concentric:

This subclass is indented under subclass 177.1. Subject matter wherein at least two elongated feed means have a common axis and are arranged one inside the other.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
213+, and 220+, for a rotatable mixing chamber.

178.2 Feed means has plural identical outlets:

This subclass is indented under subclass 177.1. Subject matter wherein one of the feed means has a plurality of outlets into the mixing chamber that are substantially the same size and shape.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

165.5, and 173.2, for other feed means having a plurality of outlets.

181.6, for nonconcentric feed means having plural identical outlets opening into a mixing chamber, all of the outlets being connected to the same source of material. See the search notes in subclass 181.6 for further locations of mixing apparatus having plural material feed means or outlets.

181.1 Including chute or hopper with gravity discharge to mixing chamber:

This subclass is indented under subclass 177.1. Subject matter wherein the feed means includes a chute or hopper that supplies material solely by gravity.

(1) Note. A hopper is a funnel-shaped container usually, but not necessarily, used for dispensing fluent solids. A chute is an open-topped channel or conduit for guiding material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

41, for a movable charge hopper or chute for a mortar mixer.

68, for a movable chute for a mortar mixer.

SEE OR SEARCH CLASS:

193, Conveyors, Chutes, Skids, Guides, and Ways, for a chute, per se.

178.3 Inner feeder passes through wall of outer feeder and extends along common axis at the wall:

This subclass is indented under subclass 177.1. Subject matter in which (a) an inner one of the feed means extends through a wall of an outer one of the feed means forming an intersection between them and (b) the axis of the inner feed means extends along the common axis of the feed means at the intersection.

181.2 Including distributor:

This subclass is indented under subclass 181.1. Subject matter including means for distributing material over a region of the mixing chamber as it is being introduced into the mixing chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

183.2, for an obstruction or distributing device in a static conveyor.

179.1 Intermittent feed:

This subclass is indented under subclass 177.1. Subject matter wherein at least one of the feed means supplies quantities of material to the chamber in recurrent interrupted sequence.

(1) Note. Means to intermittently operate flow control means for the material to repeat a material-supplying operation without operator intervention is required for placement in this subclass.

181.3 Including gate, valve, or closure:

This subclass is indented under subclass 181.1. Subject matter including a valve, gate, or closure for controlling release of material from the chute or hopper.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

182.3, for a container having a valved outlet.

192+, for a valve or gate in the outlet of a mixing chamber.

180.1 Rotating mixing chamber:

This subclass is indented under subclass 177.1. Subject matter wherein the mixing chamber is rotatable.

181.4 Rotating stirrer and cooperating stationary element:

This subclass is indented under subclass 177.1. Subject matter including a rotating stirrer in the mixing chamber and a stationary deflector cooperating therewith to agitate the material in the chamber.

181.5 Stationary deflecting element in flow-through mixing chamber:

This subclass is indented under subclass 177.1. Subject matter including an obstacle in the mixing chamber past which the material flows and which deflects or changes the motion of the material to promote mixing of the material.

- (1) Note. To be placed in this subclass, the obstacle must be an element other than the mixing chamber wall, even if collision of material with the wall is responsible for agitating the material.
- (2) Note. An obstacle agitating only one of a plurality of materials fed to the mixing chamber before combination with other materials is not considered to be within the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

302+, for a stationary element in a mixing chamber cooperating with a rotating stirrer. See the search notes in subclass 302 for other locations of mixing apparatus having stationary agitating elements.

181.6 Feed means has plural identical outlets:

This subclass is indented under subclass 177.1. Subject matter wherein a feed means has a plurality of outlets opening into the mixing chamber which are substantially the same size and shape.

SEE OR SEARCH THIS CLASS, SUBCLASS:

3+, and 10+, for mortar mixing apparatus in which fluid is introduced into a mixing region of a conveying conduit through a plurality of substantially identical inlets.

165.5, and 173.2, for feed means having plural outlets into a mixing chamber from the same source of material.

172.1, and 173.1+, for a mixing chamber having plural liquid injectors.

178.2, for concentric feed means, one of which has a plurality of identical outlet openings into a mixing chamber

181.7 Feed to narrow space between stirrer and chamber wall:

This subclass is indented under subclass 177.1. Subject matter including a rotatable stirrer in the mixing chamber defining a space of relatively small radial dimension between the periphery of the stirrer and the wall of the mixing chamber and wherein one of the feed means introduces material directly into the space.

SEE OR SEARCH THIS CLASS, SUBCLASS:

305, for similar apparatus wherein the stirrer is spaced a small distance from a cooperating stationary element in the mixing chamber.

181.8 Fluid pump:

This subclass is indented under subclass 177.1. Subject matter wherein one of the feed means is a device that acts on fluid to force it to move along a path to the mixing chamber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

160.2+, 176.1+, and 182.2, for feed means including a pump.

182.1 Including specific structure for controlling flow through the feed means:

This subclass is indented under subclass 150.1. Subject matter including means to start, stop, or regulate the flow of material in the feed means.

- (1) Note. The mere disclosure of a valve or pump is not sufficient for placement of a patent in this subclass. There must be a disclosure of valve details, a valve operator mechanism, pump feed rate adjustment means, or other feature directly related to adjustment or control of material flow rate.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 160.1, through 160.5, for apparatus including mixing ratio control means.
- 162.5, for apparatus in which the flow of jets of material is controlled by a reciprocating cleanout rod.
- 165.4, for feed means including a flow regulator in a mixing apparatus in which material has rotary motion.
- 176.2, for a variable restriction which agitates or emulsifies material flowing through it.

182.2 Including pump:

This subclass is indented under subclass 182.1. Subject matter wherein the feed means includes a pump that directly forces material into the mixing chamber.

- (1) Note. A "pump" includes a screw- or auger-type feed means for purposes of this subclass.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 160.2+, 176.1+, and 181.8, for feed means including a pump.

182.3 Including feed container having valved outlet:

This subclass is indented under subclass 182.1. Subject matter wherein the feed means includes a feed chamber for holding a volume of material, and the means to start, stop, or regulate the flow of material includes a valve in an outlet of the feed chamber to regulate flow from the feed chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 181.3, for a chute or hopper having a gate, valve, or closure in an outlet thereof.
- 192+, for a valve or gate in the outlet of a mixing chamber.

182.4 Including valve in feed conduit:

This subclass is indented under subclass 182.1. Subject matter wherein the feed means includes a tubular conduit, and the means to start, stop, or regulate the flow of material to the mixing chamber includes a valve.

183.1 Static conveyor with gravity discharge to mixing chamber:

This subclass is indented under subclass 150.1. Subject matter wherein the feed means includes a fixed structure which conducts the material solely by gravity to the mixing chamber.

- (1) Note. The feed structure may be a chute, hopper, funnel, etc. The material must be fed solely by gravity through the static structure. The structure must be stationary during feeding.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 181.1+, for plural feed means including a static conveyor.

183.2 Obstruction or distributing means in outlet (e.g., screen):

This subclass is indented under subclass 183.1. Subject matter including stationary flow-modifying means in the outlet of the static conveyor past which material must flow to enter the mixing chamber.

- (1) Note. The flow-modifying means may be, for example, a guide to enhance distribution of material throughout the mixing chamber or a screen or filter for breaking up or preventing entry of lumps of material or foreign matter into the mixing chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 181.2, for a chute or hopper having a stationary distributor for material escaping therefrom into the mixing chamber.

183.3 To rotatable mixing chamber:

This subclass is indented under subclass 183.1. Subject matter wherein the mixing chamber is rotatable to agitate the material therein.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 170.4, for a stationary feed conduit received within a rotatable stirrer shaft.
- 175.1, and 175.3, for a liquid injector received in a moving mixing chamber.

213+, and 220+, for a rotatable mixing chamber.

183.4 Closed connection between conveyor and mixing chamber (e.g., sealed joint):

This subclass is indented under subclass 183.3. Subject matter including means for closing off a space between the fixed material-conducting structure and a wall forming an integral portion of the rotatable mixing chamber so as to prevent escape of material between the material-conducting structure and the wall.

SEE OR SEARCH CLASS:

277, Seal for a Joint or Juncture, subclasses 345+ for a seal between relatively movable parts (i.e., a dynamic seal).

184 WITH SPECIFIED DISCHARGE MEANS:

This subclass is indented under the class definition. Apparatus and corresponding methods including a particularly described means for conveying or releasing material from the mixing chamber.

- (1) Note. Mere recitation of an opening, outlet port, or discharge conduit for the material will not be considered specified discharge means. However, any of the following claimed particulars will be considered as specified means for this or an indented subclass: (a) Means for applying pressure on the material to move it out of the chamber (e.g., pump compressed air). (b) Conveyor means (e.g., belt, chute, screw, spout). (c) Discharge control means (e.g., valve, fate). (d) Means for tilting or permitting tilting of the chamber on its support for discharge of the contents.

SEE OR SEARCH THIS CLASS, SUBCLASS:

42+, for dynamic delivery means to a mortar mixer.

162.5, for an impinging jet mixing device in which the mixture is discharged from a mixing chamber by a cleanout rod passing through the chamber.

SEE OR SEARCH CLASS:

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 142+ for a fluid sprinkling or spraying device with agitation of its supply.

185 By tilting mixing chamber:

This subclass is indented under subclass 184. Subject matter wherein the mixing chamber is pivotable relative to its support so as to permit material to flow therefrom under the force of gravity.

SEE OR SEARCH THIS CLASS, SUBCLASS:

45+, for mortar chamber tiltable for delivery.

SEE OR SEARCH CLASS:

414, Material or Article Handling, subclass 405, 425, 697+, and others for material containers which may be tilted.

186 By endless belt or screw conveyor:

This subclass is indented under subclass 184. Subject matter wherein the discharge means includes an endless belt or screw conveyor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

1+, for endless belt or screw conveyor to feed or discharge to a mortar mixer.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 804+ for an endless belt conveyor, per se, and subclasses 657+ for a screw conveyor, per se.

187 Rotatable or oscillatable mixing chamber:

This subclass is indented under subclass 184. Subject matter wherein the mixing chamber is rotatable in one direction only, or alternatively rotatable about its axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

219+, for a rotatable or oscillatable mixing chamber.

- 188 Closure-type discharge:**
This subclass is indented under subclass 187. Subject matter including an opening in the wall of the mixing chamber and a movable or removable cover for the opening for selectively permitting the material to flow from the chamber under the force of gravity.
- 189 Batch discharge:**
This subclass is indented under subclass 184. Subject matter wherein a predetermined quantity of material is removed or release from the chamber by the discharge means.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
162.5, for an impinging jet mixer having a relatively movable clean-out rod for discharging material from the mixing chamber.
- 190 By pump within mixing chamber:**
This subclass is indented under subclass 184. Subject matter wherein egress of the material from the mixing chamber is effected by an agitating element which is in contact with the material in cooperation with a confined flow path within the chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
191, for a pump situated exteriorly of the mixing chamber to effect the discharge of material therefrom by creating a pressure variation in the chamber.
- 191 By suction or compressed air:**
This subclass is indented under subclass 184. Subject matter wherein the material is caused to egress the chamber by means producing a partial vacuum at the discharge opening of the mixing chamber or increasing the pressure of the air on the surface of the material in the mixing chamber.
- 192 Valve or gate:**
This subclass is indented under subclass 184. Subject matter wherein the flow of the material from the mixing chamber is regulated by a movable means that opens, shuts, or partially blocks a discharge opening in or passageway from the chamber.
- 193 Sliding gate:**
This subclass is indented under subclass 192. Subject matter wherein the movable means is a closure which is rectilinearly reciprocable in a path transverse to the opening or passageway.
- 194 With rotatable or oscillatable stirrer:**
This subclass is indented under subclass 184. Subject matter including a stirrer within the mixing chamber which is rotatable about its axis in one direction, or alternatively in opposite directions.
- 195 Interrelated with discharge means:**
This subclass is indented under subclass 194. Subject matter wherein the stirrer cooperates with the specified discharge means to effect or regulate the flow of material from the mixing chamber.
- 196 Discharge effected by stirrer:**
This subclass is indented under subclass 194. Subject matter wherein the stirrer, in its agitating movement, acts directly on the material to cause its egress from the mixing chamber.
- 197 MIXING CHAMBER REMOVABLE FROM STIRRER AND SUPPORT:**
This subclass is indented under the class definition. Apparatus and corresponding methods including means to hold a mixing chamber and a stirrer during agitation wherein the chamber can be removed from the holder and the stirrer.
- (1) Note. If the chamber and stirrer are removed as a unit and the stirrer is not removable, see subclass 219 below.
- (2) Note. For proper placement of patents in this and indented subclasses, the chamber does not have to be claimed.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
129, for an operator supported chamber and stirrer.
219+, for a chamber movable relative to a support which may include a stirrer.
- 198 Plural supports:**
This subclass is indented under subclass 197. Subject matter having more than one support.

- 199 Removable power drive means:**
This subclass is indented under subclass 197. Subject matter including a power source for moving the stirrer and/or the support which can be remove.
- 200 Support rotatable only:**
This subclass is indented under subclass 197. Subject matter wherein the support turns in one direction about a fixed axis during agitation.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
213, for a support rotatable in one direction only in which a chamber is removable from the support.
- 201 Adjustable stirrer:**
This subclass is indented under subclass 200. Subject matter wherein the stirrer is adjustable relative to the chamber and the adjustment is independent of the agitation.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
207, for any adjustable stirrer and/or mixing chamber.
254, for an adjustable stirrer mounted in a chamber closure.
285, for an adjustable stirrer and a fixed mixing chamber.
- 202 Support oscillatory only:**
This subclass is indented under subclass 197. Subject matter wherein the support rotates alternately in opposite directions about an axis.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
210+, for an oscillatory support where the mixing chamber is removable.
- 203 Support rectilinearly reciprocable only:**
This subclass is indented under subclass 197. Subject matter wherein the support moves back and forth in a straight line and in the same path.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
212, for rectilinearly reciprocable support without a stirrer.
- 204 Mixing chamber mounted within container:**
This subclass is indented under subclass 197. Subject matter wherein the mixing chamber is supported by a receptacle and is on the inside of the receptacle.
- (1) Note. The use of the container is for cooling of the chamber but not limited to such and the patents are placed here, not in subclass 149.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
149, for a jacket over a mixing chamber for cooling it.
- 205 Stirrer mounted through mixing chamber bottom wall:**
This subclass is indented under subclass 197. Subject matter wherein the stirrer is removable from the bottom of wall of the mixing chamber.
- 206 With motor control:**
This subclass is indented under subclass 197. Subject matter including means for governing the starting, stopping direction of motion, acceleration, speed retardation, etc., of a motor.
- 207 Adjustable:**
This subclass is indented under subclass 197. Subject matter wherein the stirrer and or the mixing chamber are adjustable relative to each other.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
201, for an adjustable stirrer, and see search notes.
- 208 BY MOVEMENT OF SUPPORT FOR REMOVABLE MIXING CHAMBER:**
This subclass is indented under the class definition. Apparatus and corresponding methods including means to hold a mixing chamber and means to permit the holder to move during agitation, wherein the chamber is removable from the holder.
- (1) Note. For proper placement of patents in this and indented subclasses, the chamber does not have to be claimed.

- (2) Note. The mixing chamber support has the same movement with or without the mixing chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
197+, for a movable support for a removable mixing chamber and a stirrer.
219+, for a mixing chamber movable relative to a fixed support.
- 209 Mixing chamber secured to support:**
This subclass is indented under subclass 208. Subject matter including means to fasten the mixing chamber to the surface.
- 210 Support oscillatory only:**
This subclass is indented under subclass 209. Subject matter wherein the support rotates alternately in opposite directions about an axis.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
202, for an oscillatory support and stirrer.
- 211 Motor driven:**
This subclass is indented under subclass 210. Subject matter wherein the support is moved by a power source which converts one form of energy to another form of energy.
- 212 Support rectilinearly reciprocable only:**
This subclass is indented under subclass 209. Subject matter wherein the support moves back and forth in a straight line and in the same path.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
203, for rectilinearly reciprocable support and a stirrer.
- 213 Support rotatable only:**
This subclass is indented under subclass 209. Subject matter wherein the support turns in but one direction about an axis during agitation.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
54+, for a mortar-type mixer having a rotatable mixing chamber.
170.1, 175.1, 180.1, and 183.3, for a rotatable mixing chamber having specified feed means.
- 200, for a rotatable support and stirrer means.
- 220+, for a mixing chamber rotatable relative to a stationary support.
- 214 And means to clamp plural mixing chambers:**
This subclass is indented under subclass 213. Subject matter including means to secure more than one mixing chamber to said support.
- (1) Note. Also included are plural means to support plural mixing chambers.
- 215 Support pivotally mounted by plural linkage:**
This subclass is indented under subclass 209. Subject matter wherein the support is suspended by more than one rod, strap, etc., which are movable about their own axis and cause the support to move in an accurate path.
- 216 Support oscillatory with additional motion:**
This subclass is indented under subclass 209. Subject matter wherein the support rotates alternately in opposite directions about an axis and also moves in another direction during agitation.
- (1) Note. The second motion can be oscillatory, rectilinearly, etc.
- 217 Support rotates about plural axes:**
This subclass is indented under subclass 209. Subject matter wherein the support turns in but one direction about an axis and also turns in but one direction about another axis where the axes are at an angle to each other.
- 218 Mixing chamber conveyed by support during agitation:**
This subclass is indented under subclass 208. Subject matter wherein the mixing chamber is moved along or with a device which supports it and causes agitation.
- 219 BY MOVEMENT OF MIXING CHAMBER RELATIVE TO STATIONARY SUPPORT:**
This subclass is indented under the class definition. Apparatus and corresponding methods including a chamber and means to support the chamber against the force of gravity while allowing the chamber to move with respect to

- support during agitation the means to support the chamber being fixed with respect to a surface that does not move.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
129, for a chamber support by an operator during agitation.
- 220 Mixing chamber rotatable only:**
This subclass is indented under subclass 219. Subject matter wherein the chamber revolves about a fixed axis in one direction only during agitating.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
54+, for a mortar-type mixer having a rotatable mixing chamber.
170.1, 175.1, 180.1, and 183.3, for a rotatable mixing chamber having specified feed means.
213+, for a removable mixing chamber mounted on a rotatable support.
237, for an oscillating chamber.
- 221 With scraper:**
This subclass is indented under subclass 220. Subject matter wherein an element having an edge, flaccid surface, etc., which is in contact with or in close proximity to the chamber wall causes material to be moved away from the wall.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
309, for a scraper within a stationary chamber.
- 222 Interrelated stirrer and mixing chamber drive:**
This subclass is indented under subclass 220. Subject matter having means to move the chamber and also move a stirrer.
- 223 Effecting counter rotation:**
This subclass is indented under subclass 222. Subject matter wherein the chamber moves in one direction and the stirrer in the opposite.
- 224 With rotatable stirrer:**
This subclass is indented under subclass 220. Subject matter including a stirrer that turns in but one direction about an axis.
- 225 With deflector:**
This subclass is indented under subclass 220. Subject matter including a device which is secured within and in fixed relation to the mixing chamber or a stationary element in the mixing chamber and serving to divert portions of the material in the mixing chamber so as to assist in the agitation.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
221, for a scraper which can act as a deflector.
- 226 Foraminous type:**
This subclass is indented under subclass 225. Subject matter wherein the element is porous.
- 227 Helical type:**
This subclass is indented under subclass 225. Subject matter wherein the deflector is an elongated strip twisted in a spiral shape about the axis of rotation of the chamber, or a segment of such a spirally shape strip.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
310, for a helical-type scraper in a stationary mixing chamber.
320, for a helical ribbon stirrer in a stationary mixing chamber.
338, for a deflector having curved surfaces and located in a stationary flow-through mixing chamber.
339, for such a deflector in the form of a helical ribbon.
- 228 Attached directly to chamber wall:**
This subclass is indented under subclass 225. Subject matter wherein the deflector is secured in direct contact with the chamber wall.
- 229 Additional deflector on support in chamber:**
This subclass is indented under subclass 228. Subject matter having a deflector which is not directly attached to the chamber wall.
- 230 Deflector stationary:**
This subclass is indented under subclass 225. Subject matter wherein the deflector does not move during agitation.

- (1) Note. The mixing chamber rotates but the deflector does not moving during agitation.
- 231 Suspended within chamber:**
This subclass is indented under subclass 230. Subject matter wherein the deflect is supported from above the chamber.
- 232 Mixing chamber supported by shaft at one end only:**
This subclass is indented under subclass 220. Subject matter wherein the mixing chamber has an axle from one and only which permits it to rotate.
- (1) Note. The mixing chamber may be supported at the end opposite the shaft by roller, guides, etc.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
233, for a mixing chamber supported by rollers.
- 233 Roller or suspended support for mixing chamber:**
This subclass is indented under subclass 220. Subject matter wherein the mixing chamber moves relative to rotating cylinders or wheels which underlie the chamber during rotating, or hangs by a support from above so as to allow relative movement of the chamber.
- 234 Foraminous mixing chamber:**
This subclass is indented under subclass 220. Subject matter wherein at least part of the mixing chamber is porous.
- 235 Plural mixing chambers:**
This subclass is indented under subclass 220. Subject matter wherein there is more than one mixing chamber.
- 236 Rectangular mixing chamber:**
This subclass is indented under subclass 220. Subject matter wherein the mixing chamber has four sides and four right angles.
- 237 Mixing chamber oscillating only:**
This subclass is indented under subclass 219. Subject matter wherein the chamber is rotatable, reciprocated about a fixed axis and there is not other motion.
- 238 With stirrer:**
This subclass is indented under subclass 237. Subject matter including a stirrer to agitate material.
- 239 Mixing chamber rocking only:**
This subclass is indented under subclass 219. Subject matter wherein the chamber is mounted on a rocker which allows the chamber to move in a back and forth curved path and there is no other motion.
- 240 Mixing chamber rectilinearly reciprocating only:**
This subclass is indented under subclass 219. Subject matter wherein the chamber is moved in alternate directions in a straight line and there is no other motion.
- 241 STIRRER WITHIN STATIONARY MIXING CHAMBER:**
This subclass is indented under the class definition. Apparatus and corresponding methods including a mixing chamber which is in fixed position during agitation and a stirrer within the chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
197+, for a stationary mixing chamber that is removable from a stirrer and support.
- SEE OR SEARCH CLASS:
206, Special Receptacle or Package, subclasses 217+ for a drinking vessel and material packaged therein with a space provided for the addition of a liquid to be mixed with the material.
- 242 Mounted in removable mixing chamber closure:**
This subclass is indented under subclass 241. Subject matter wherein the stirrer is mounted in an entirely supported by a closure that is removable from the chamber.

- 243 Oscillatory stirrer:**
This subclass is indented under subclass 242. Subject matter wherein the stirrer is rotatable alternately in opposite directions about an axis.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
276+, for an oscillatory stirrer in a fixed mixing chamber.
- 244 Rotatable stirrer:**
This subclass is indented under subclass 242. Subject matter wherein the stirrer turns in one direction about an axis.
- 245 Axis fixed:**
This subclass is indented under subclass 244. Subject matter wherein the axis of the stirrer turns, but is stationary with respect to its longitudinal movement.
- 246 Coincident axes:**
This subclass is indented under subclass 245. Subject matter wherein the stirrers have a congruent axis.
- 247 Single stirrer:**
This subclass is indented under subclass 245. Subject matter wherein there is only one stirrer.
- 248 Bent bar:**
This subclass is indented under subclass 247. Subject matter wherein the stirrer is an integral bar or rod that is of curved or crooked shape to produce agitation.
- 249 Motor driven:**
This subclass is indented under subclass 247. Subject matter wherein the rotating stirrer is moved by a power source which converts one form of energy into another form of energy.
- 250 Fluid motor:**
This subclass is indented under subclass 249. Subject matter wherein the power source is rotated by a fluid means.
- (1) Note. The fluid may enter into and become part of the material to be mixed or the fluid may be external of the mixed material.
- 251 Electric motor:**
This subclass is indented under subclass 249. Subject matter wherein the power source is rotated by an electric current.
- 252 Gear driven:**
This subclass is indented under subclass 247. Subject matter wherein the rotatable stirrer is driven by a gear or gearing arrangement.
- 253 Having cooperating stationary element:**
This subclass is indented under subclass 252. Subject matter wherein the mixing chamber has an immovable element therein which cooperates with the rotatable stirrer to effect agitation.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
230, for a stationary deflector and a rotatable chamber.
302+, for a stationary element in a mixing chamber cooperating with a rotating stirrer. See the search notes in subclass 302 for other locations of mixing apparatus having a stationary agitating element.
- 254 Adjustable stirrer or stirrer element:**
This subclass is indented under subclass 252. Subject matter wherein, prior to agitation, (1) the position of the stirrer relative to the chamber may be varied, or (2) the position of an element of the stirrer may be varied relative to the position of another element of the stirrer.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
201, for an adjustable stirrer and a mixing chamber removable from a support.
285+, for an adjustable rotatable stirrer not mounted in a removable chamber closure.
326.1, for an adjustable element of a rotatable stirrer not mounted in a removable chamber closure.
- 255 Translatable stirrer:**
This subclass is indented under subclass 242. Subject matter wherein all parts of the stirrer move with the same velocity.

- 256 Rectilinearly reciprocable only:**
This subclass is indented under subclass 255. Subject matter wherein the stirrer is mounted for movement only in alternate directions along a straight line in the mixing chamber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
255, for stirrers having additional movements.
- 257 Plural stirrers:**
This subclass is indented under subclass 256. Subject matter wherein there is more than one stirrer.
- 258 With rotary input drive:**
This subclass is indented under subclass 256. Subject matter wherein the movement of the stirrer is produced by a rotating element or by revolution of a crank, the motion of the rotating element or crank being converted to straight line movement in alternate directions.
- 259 Actuated by pivoted lever:**
This subclass is indented under subclass 256. Subject matter wherein the movement of the stirrer is produced by an element which moves about a point in such a manner so as to move the stirrer in a straight line.
- 260 Spring return:**
This subclass is indented under subclass 256. Subject matter wherein an elastic body is employed to return the stirrer from one direction of reciprocable movement.
- 261 With means to move stirrer and support:**
This subclass is indented under subclass 241. Subject matter wherein the stirrer has a support means and additional means are provided for moving the support and stirrer in a direction transverse to the longitudinal axis of the stirrer.
- 262 Pump type:**
This subclass is indented under subclass 241. Subject matter wherein a confined flow path within the mixing chamber forms part of the course through which material is caused to pass by means of a pump within the chamber which (a) directly forces or induces material through the flow path, or (b) causes the material to move to and fro in said path, thereby producing turbulence and agitation of the material in the chamber.
- 263 Centrifugal:**
This subclass is indented under subclass 262. Subject matter wherein the pump is of the centrifugal force type, e.g., radial and tangential flow.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
164.1+, for a stirrer arranged to create suction in a mixing chamber for drawing material into the chamber.
272, for a gear-type pump which moves material through a mixing chamber while simultaneously agitating the material.
- 264 Impeller with outer stationary ring:**
This subclass is indented under subclass 263. Subject matter wherein the centrifugal pump comprises a rotating impeller and an outer stationary ring located in the same general diametrical plane with the impeller.
- 265 Impeller only:**
This subclass is indented under subclass 263. Subject matter wherein the centrifugal pump comprises a rotating impeller only. e.g., cooperates with no other element.
- 266 Screw:**
This subclass is indented under subclass 262. Subject matter wherein the pump is a continuous helical ribbon rotatable about its longitudinal axis to produce the pumping action.
- 267 Piston:**
This subclass is indented under subclass 262. Subject matter wherein the pump is a piston that causes material to move.
- 268 Plural:**
This subclass is indented under subclass 267. Subject matter wherein there are two or more pistons for moving the material.

- 269 Inlet and outlet at same end of flow path:**
This subclass is indented under subclass 267. Subject matter wherein the inlet and outlet to the flow path is at the same end of the flow path.
- 270 Propeller blade type:**
This subclass is indented under subclass 262. Subject matter wherein the pump has one or more blades which when rotated about a central shaft produces movement of the material in a direction parallel to the axis of rotation.
- 271 Endless conveyor with paddles:**
This subclass is indented under subclass 241. Subject matter wherein the stirrer is attached to an endless conveyor for agitating the material.
- 272 Gear-type stirrer:**
This subclass is indented under subclass 241. Subject matter wherein the stirrer comprises at least two members having meshing teeth, at least one of said members being rotatable and such rotation causing agitation of material in the chamber.
- 273 Magnetic stirrer:**
This subclass is indented under subclass 241. Subject matter wherein the magnetic flux device is within the means to hold the mixing chamber.
- 274 Actuating means in base support:**
This subclass is indented under subclass 273. Subject matter wherein the magnetic flux device is within the means to hold the mixing chamber.
- 275 Flexible diaphragm:**
This subclass is indented under subclass 241. Subject matter wherein the stirrer is a resilient diaphragm within the chamber or chamber walls which on movement agitates the material within the chamber.
- 276 Oscillatory stirrer:**
This subclass is indented under subclass 241. Subject matter wherein the stirrer is rotating alternately in opposite directions about an axis.
- 277 With additional motion:**
This subclass is indented under subclass 276. Subject matter wherein the stirrer is moved in another direction e.g., rectilinearly rotatable, etc.
- 278 Including rotatable input drive:**
This subclass is indented under subclass 276. Subject matter wherein the oscillating motion of the stirrer is caused by a rotatable means.
- (1) Note. The rotatable means may be a hand crank, crank wheel, or motor.
- 279 Rotatable stirrer:**
This subclass is indented under subclass 241. Subject matter wherein the stirrer rotates about a fixed axis in one direction.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
157.1+, 158.1, 164.1+, 165.3, 168.1+, 181.4, and 181.7, for a rotatable stirrer in a mixing chamber having specified feed means.
- SEE OR SEARCH CLASS:
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, subclasses 9+ for continuous liquid phase colloid systems (e.g., foams, emulsions, suspensions, dispersions) 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.
- 280 With movable element actuated by material:**
This subclass is indented under subclass 279. Subject matter wherein the movement of the material being mixed causes movement of an element within the chamber.
- (1) Note. The element may be a stirrer or may be mounted on either the container or a stirrer.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
168.2, for a rotatable stirrer in a mixing chamber driven by material fed to the mixing chamber.
- 281 With support for attachment to mixing chamber rim:**
This subclass is indented under subclass 279. Subject matter wherein the stirrer has means to hold the stirrer on the rim of the mixing chamber.
- 282 With motor drive:**
This subclass is indented under subclass 281. Subject matter including a power source for converting one form of energy into another to cause motion of the stirrer.
- 283 With gear drive:**
This subclass is indented under subclass 281. Subject matter including at least two members having meshing teeth, at least one of said members rotatable by a source of power and such rotation causing the other member to rotate.
- 284 Including adjustable rim contact support:**
This subclass is indented under subclass 283. Subject matter wherein the support attaching the stirrer to the rim has one or more mechanical elements which may be varied.
- 285 Adjustable:**
This subclass is indented under subclass 279. Subject matter wherein the stirrer's position may be moved relative to the mixing chamber prior to agitation.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
201, for an adjustable stirrer and a mixing chamber removable from a support.
254, for a rotatable and adjustable stirrer mounted in a removable mixing chamber closure.
- 286 Axially:**
This subclass is indented under subclass 285. Subject matter wherein the stirrer is positioned along its axis of rotation.
- 287 Planetary:**
This subclass is indented under subclass 279. Subject matter wherein the stirrer rotates on its own axis as well as revolves about a second and different axis.
- 288 Axes of rotation and revolution parallel:**
This subclass is indented under subclass 287. Subject matter wherein the stirrer axis is parallel to the axis about which the stirrer revolves.
- 289 Also axially reciprocable:**
This subclass is indented under subclass 279. Subject matter wherein the rotatable stirrer also has axial movement alternatively back and forth in a straight line.
- 290 In at least one of intercommunicating adjacent mixing chambers:**
This subclass is indented under subclass 279. Subject matter wherein a rotatable stirrer is located within at least one of a plurality of mixing chambers which are in communication with each other so that material may flow from one chamber to another.
- (1) Note. The communication may be by means of a conduit or through or across a partition separating the chambers.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
154.1+, for a mixing chamber combined with a feeder or supply reservoir and an agitator in the feed or reservoir.
- 291 Plural stirrers on parallel axes in adjacent mixing chambers:**
This subclass is indented under subclass 290. Subject matter wherein there is at least one stirrer in at least two mixing chambers and the axis of the stirrers are parallel to each other.
- 292 Plural stirrers:**
This subclass is indented under subclass 279. Subject matter wherein there is more than one stirrer and at least one of them rotates.
- 293 Coaxial:**
This subclass is indented under subclass 292. Subject matter wherein the stirrers have coincident axes.

- 294 Differing in speed:**
This subclass is indented under subclass 293. Subject matter wherein one stirrer moves at a rate unequal to the rate of motion of another stirrer.
- 295 Diverse stirrers:**
This subclass is indented under subclass 293. Subject matter wherein the stirrers are of a different type.
- 296 Rotating in opposite directions:**
This subclass is indented under subclass 293. Subject matter wherein the stirrers are rotatable and are driven in opposite directions relative to each other.
- 297 On parallel axes:**
This subclass is indented under subclass 292. Subject matter wherein at least two of the stirrers are mounted so as to extend in the same direction.
- 298 Differing in speed:**
This subclass is indented under subclass 298. Subject matter wherein one stirrer moves at a rate unequal to the rate of motion of another stirrer.
- 299 Diverse stirrers:**
This subclass is indented under subclass 297. Subject matter wherein the parallel stirrers are of a different type.
- 300 Rotating in opposite directions:**
This subclass is indented under subclass 297. Subject matter wherein the parallel stirrers are rotating in opposite directions relative to each other.
- 301 Intermeshing with each other:**
This subclass is indented under subclass 297. Subject matter wherein one of the stirrers has a profile which contacts a mating surface of a parallel stirrer along the length thereof.
- 302 Having cooperating stationary element:**
This subclass is indented under subclass 279. Subject matter wherein the mixing chamber has an immovable element therein which cooperates with the rotatable stirrer to effect or perfect agitation.
- (1) Note. Included here is a stationary scraper, wiper, or brush for removing material from the stirrer.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 164.4, for a stationary deflector in a mixing chamber having a rotating stirrer and specified feed means.
- 165.2, for a deflector in a mixing chamber, material being introduced into the chamber so as to cause rotary motion of the material therein.
- 171.1, for a rotating stirrer and cooperating stationary element in a mixing chamber including a liquid injector.
- 174.1+, for a stationary deflector in a mixing chamber having a liquid injector.
- 181.5, for a mixing chamber without a moving stirrer having specified feed means and in which material is mixed by flow past a stationary deflector.
- 181.7, for a mixing apparatus having plural feed means in which a stirrer and mixing chamber wall are separated by a small distance and cooperate to shear the material at a rate sufficient to mix the material.
- 253, for a rotatable stirrer mounted in a removable mixing chamber closure and cooperating with a stationary element.
- 264, for a centrifugal impeller with an outer stationary ring.
- 309+, for a rotatable stirrer in a mixing chamber and a movable scraper, wiper or brush for removing material from the chamber wall surface.
- 336+, for a flow-through mixing chamber without a moving stirrer having a stationary deflector for dividing and recombining material flowing through the mixing chamber.
- 303 Interdigitating:**
This subclass is indented under subclass 302. Subject matter wherein at least one of the stirrers or immovable elements has at least two adjacent projections and the other has at least one projection which extends between the previous two adjacent projections.

- 304 Parallel to axis of rotation:**
This subclass is indented under subclass 303. Subject matter wherein the projections extend in a direction parallel to the axis of rotation.
- 305 Cylindrical or conical stirrer or element:**
This subclass is indented under subclass 302. Subject matter wherein either the stirrer or stationary element has a substantially cylindrical or substantially conical configuration.
- (1) Note. The term "substantially conical" is intended to include truncated conical elements.
- 306 Element mounted on mixing chamber end wall:**
This subclass is indented under subclass 302. Subject matter wherein the stationary element is attached to the end of the mixing chamber.
- 307 Element mounted on cylindrical mixing chamber wall:**
This subclass is indented under subclass 302. Subject matter wherein the stationary element is attached to the curved wall of a substantially cylindrical mixing chamber.
- 308 Collapsible articulated stirrer:**
This subclass is indented under subclass 279. Subject matter wherein the rotatable stirrer has means for enabling the stirrer to be folded into a more compact shape.
- (1) Note. Normally the folding is for insertion into and out of a reduced opening in the mixing chamber.
- 309 Including scraper, wiper, or brush:**
This subclass is indented under subclass 279. Subject matter including an element having an edge of a flaccid surface or a plurality of bristles movable in contact with or in close proximity to a wall of the chamber for removing material from the wall surface.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
67, for similar apparatus disclosed for use as a mortar mixer.
302+, for a rotatable stirrer and a cooperative stationary scraper, wiper, or brush for removing material from the stirrer.
- 310 Helical type:**
This subclass is indented under subclass 309. Subject matter wherein the edge has a spiral configuration extending axially about the axis of rotation of the stirrer.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
227, for helical-type deflector in a rotatable mixing chamber.
320, for a helical ribbon stirrer in a stationary mixing chamber.
338, for a deflector having curved surfaces and located in stationary flow-through mixing chamber.
339, for such a deflector in the form of a helical ribbon.
- 311 Pivotaly mounted on noncoincident axis:**
This subclass is indented under subclass 309. Subject matter wherein the element is pivotaly mounted on the support about an axis other than the axis of rotation of the stirrer.
- 312 Plural distinct scraping edges or wiping surfaces:**
This subclass is indented under subclass 309. Subject matter having more than one discrete scraping edge or wiping surface.
- (1) Note. The edges may be either on a single element or on separate elements.
- 313 Axially offset:**
This subclass is indented under subclass 312. Subject matter wherein the two scraping edges are either spaced apart in the direction of the axis of rotation of the stirrer or wherein each edge has a portion extending beyond the other edge in the axial direction.
- 314 Mounted in mixing chamber bottom wall:**
This subclass is indented under subclass 279. Subject matter wherein the stirrer is carried by the bottom wall of the mixing chamber.
- 315 Disk-type stirrer:**
This subclass is indented under subclass 279. Subject matter wherein the stirrer has a generally flat plate-like configuration.

- 316 Apertured or notched:**
This subclass is indented under subclass 315. Subject matter wherein the stirrer has an opening therethrough or indent in the outer edge.
- 317 With projection:**
This subclass is indented under subclass 315. Subject matter wherein the stirrer has an element projecting from a surface or the periphery of the stirrer.
- 318 Screw-type stirrer:**
This subclass is indented under subclass 279. Subject matter wherein the stirrer comprises a helical ribbon rotatable about its longitudinal axis.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
79+, for a stirrer comprising a through-pass screw conveyor.
157.2+, for a mixer including a screw-type stirrer and screw conveyor material feeder.
- 319 With additional agitator elements on screw:**
This subclass is indented under subclass 318. Subject matter including other agitator elements on the stirrer.
- (1) Note. The additional elements may be on the helical ribbon or on the stirrer shaft.
- 320 Openwork helical ribbon:**
This subclass is indented under subclass 318. Subject matter wherein the helical ribbon has an open central portion for flow of material.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
227, for a helical-type deflector in a rotatable mixing chamber.
310, for a helical-type scraper in a stationary mixing chamber.
339, for a helical ribbon deflector in a stationary flow-through mixing chamber.
- 321 Opposite pitch:**
This subclass is indented under subclass 318. Subject matter wherein the stirrer includes a helical ribbon portion of opposite pitch.
- 322 Discontinuous screw:**
This subclass is indented under subclass 318. Subject matter wherein the helical ribbon is interrupted along its length.
- 323 Varying diameter of convolutions or shank or varying pitch:**
This subclass is indented under subclass 318. Subject matter wherein the helical ribbon changes diameter along its length, or the diameter of a shaft supporting the ribbon changes, or the distance between the convolutions of the helical ribbon changes.
- 324 Apertured or notched:**
This subclass is indented under subclass 318. Subject matter wherein the helical ribbon has an opening therethrough or a notch on the edge of the ribbon or the flow of material.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
320, for a helical ribbon with an open central portion.
- 325.1 Relatively fixed plural elements:**
This subclass is indented under subclass 279. Subject matter wherein the rotatable stirrer comprises a plurality of agitating elements rigidly secured to a rotatable shaft.
- (1) Note. Contiguous agitating portions are considered to form a single agitating element except when they differ substantially in geometric form. A thin member that can be regarded as consisting of agitating portions that differ substantially only in width, and form continuous major working surfaces that may be flat, curved, or bent is considered a single agitating element. An agitating portion is a piece of material constructed and arranged to produce significant agitation of material upon movement through the material. For example, agitating portions that project from another agitating portion are considered separate agitating elements.
- (2) Note. Agitating elements may be interconnected by nonagitating portions. Agitating portions connected only by nonagitating portions are considered

separate agitating elements. The shaft of the stirrer is a nonagitating portion.

325.2 Pinlike radially projecting element:

This subclass is indented under subclass 325.1. Subject matter wherein an element is (a) elongated in the radial direction of the shaft, (b) has a substantially constant cross section perpendicular its longitudinal axis whose thickness is similar in all directions, and (c) has a free radially outer end.

- (1) Note. The element may have a cross section that is roughly a square, regular hexagonal, circle, etc.

325.3 Spiral arrangement:

This subclass is indented under subclass 325.1. Subject matter wherein the elements on the rotatable shaft are arranged in a helical pattern thereon.

- (1) Note. Not all the elements on the shaft need to be arranged in a helical pattern.

325.4 Element mounted parallel to shaft, spaced therefrom, and having at least one free end:

This subclass is indented under subclass 325.1. Subject matter wherein one of the elements extends parallel to the axis of the shaft in spaced relation to the shaft and has a free end to which no supporting structure is directly attached.

325.5 Opposite free ends:

This subclass is indented under subclass 325.4. Subject matter wherein the element has unsupported ends opposite each other.

325.6 Looped wirelike element:

This subclass is indented under subclass 325.1. Subject matter wherein one of the elements is a wire or rodlike element that is configured to form by itself a substantially continuous closed curve.

325.7 Openwork having element supported by central shaft at opposite ends:

This subclass is indented under subclass 325.1. Subject matter wherein an element is independently supported at opposite ends and spaced from the shaft between the ends.

- (1) Note. The element may be supported at each end by direct attachment to the shaft or by attachment to an intermediate supporting member. For the ends to be independently supported, any intermediate supporting members must be separate members connected to the shaft.

325.8 Element axis parallel to shaft:

This subclass is indented under subclass 325.7. Subject matter wherein the element is arranged with its axis parallel to the axis of the shaft.

325.9 Apertured element:

This subclass is indented under subclass 325.8. Subject matter wherein the element has at least one opening formed therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 90, for a rubber or heavy plastic working screw stirrer having apertures.
 316, for a disk-type stirrer having apertures.
 324, for a screw-type stirrer having apertures.
 325.91, for a stirrer having an apertured blade that is not parallel to the shaft axis.
 325.93, for a stirrer having apertured rectangular elements having planar working surfaces.
 328.2, for a stirrer having relatively fixed agitating elements and including an apertured element.

325.91 Apertured element:

This subclass is indented under subclass 325.7. Subject matter wherein the element has an opening extending through the element.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 90, for a rubber or heavy plastic working screw stirrer having apertures.
 316, for a disk-type stirrer having apertures.
 324, for a screw-type stirrer having apertures.
 325.93, for a stirrer having apertured rectangular elements having planar working surfaces.
 325.9, for a stirrer having an apertured blade that is parallel to the shaft axis.

328.2+, for a stirrer having relatively fixed agitating elements and including an apertured element.

325.92 Flat element having major surface lying in plane substantially including shaft axis (e.g., paddle type):

This subclass is indented under subclass 325.1. Subject matter wherein an element has a substantially planar working surface thereon and the axis of the shaft lies substantially in the plane of the working surface.

325.93 Apertured element:

This subclass is indented under subclass 325.92. Subject matter wherein the element has an opening formed therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 90, for a rubber or heavy plastic working screw stirrer having apertures.
- 316, for a disk-type stirrer having apertures.
- 324, for a screw-type stirrer having apertures.
- 325.9, for a stirrer having an apertured blade that is parallel to the shaft axis.
- 325.91, for a stirrer having an apertured blade that is not parallel to the shaft axis.
- 328.2+, for a stirrer having relatively fixed agitating elements including an apertured element.

325.94 Openwork having substantially no central shaft:

This subclass is indented under subclass 325.1. Subject matter wherein the elements are arranged to form a substantially open central portion along the axis of rotation and there is no shaft along the axis of rotation in the open central portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 320, for a screw-type stirrer in the form of an openwork helical ribbon.
- 325.7, for a rotatable stirrer having an agitating element forming an openwork stirrer and having a central shaft present along the axis of rotation of the stirrer in the same axial location as the agitating element.

326.1 Adjustable or flexible:

This subclass is indented under subclass 325.1. Subject matter wherein an element is capable of being adjusted relative to the shaft or an element is configured and intended to flex during mixing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 201, and 207, for an adjustable stirrer associated with a removable mixing chamber.
- 254, for an adjustable rotatable stirrer mounted on a removable mixing chamber closure.
- 284, for an adjustable rotatable stirrer mounted on an adjustable support.
- 285, for a rotatable stirrer adjustable relative to a mixing chamber.

327.1 Of different pitch:

This subclass is indented under subclass 325.1. Subject matter wherein an element has an angular inclination relative to its plane or surface of rotation that differs from that of another element.

- (1) Note. Two elements are considered to have the same pitch if the pitch of one element at any radius from the axis of rotation at which both elements are present is the same as that of the other element at the same radius.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 88, for a screw-type stirrer for mixing rubber or heavy plastics having sections of different pitch.
- 323, for a general-purpose screw stirrer having varying pitch.
- 326.1, for a rotatable stirrer having an element whose pitch is adjustable.
- 327.4, for a rotatable stirrer having an element with sections of different pitch.

327.2 Rodlike element having enlarged outer end:

This subclass is indented under subclass 327.1. Subject matter wherein an element is bar shaped, is elongated, and has an enlarged radially outer end.

327.3 Elements of opposite pitch:

This subclass is indented under subclass 327.1. Subject matter wherein an element is angled to move material in one direction and another element is angled to move material in the opposing direction.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 321, for a screw-type stirrer having sections of opposite pitch.
- 327.4, for a rotatable stirrer including agitating elements having sections of opposite pitch on the same element.

327.4 Oppositely pitched element sections:

This subclass is indented under subclass 327.1. Subject matter wherein a portion of an element is angled to move material in one direction and another portion is angled to move material in the opposing direction.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 327.3, for a rotatable stirrer including different elements having opposite pitches.

328.1 Notched element

This subclass is indented under subclass 325.1. Subject matter wherein an element has a cutout portion in its edge.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 90, for a notched screw stirrer for mixing rubber or heavy plastic.
- 316, for a notched disk-type stirrer.
- 324, for a notched screw-type stirrer of general utility.

328.2 Apertured element:

This subclass is indented under subclass 325.1. Subject matter wherein an element has an opening therethrough.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 90, for a rubber or heavy plastic working screw stirrer having apertures.
- 316, for a disk-type stirrer having apertures.
- 324, for a screw-type stirrer having apertures.

325.93, for a stirrer having an apertured rectangular element having a planar working surface.

325.9, for a stirrer having an apertured blade that is parallel to the shaft axis.

325.91, for a stirrer having an apertured blade that is not parallel to the shaft axis.

328.3 Noncircular aperture:

This subclass is indented under subclass 328.2. Subject matter wherein the aperture has a shape that is noncircular.

328.4 Square aperture:

This subclass is indented under subclass 328.3. Subject matter wherein the aperture is bounded by four sides substantially equal in length and intersect at right angles.

329.1 Diverse size or shape:

This subclass is indented under subclass 325.1. Subject matter wherein one element is of different dimensions or configuration than another element.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 81+, for a screw-type stirrer having additional agitating elements on the screw.
- 104, 295, and 299, for a mixing apparatus including plural diverse stirrers.
- 319, for a screw-type stirrer having additional agitating elements on the screw.

329.2 Elements having different lengths:

This subclass is indented under subclass 329.1. Subject matter wherein the longest dimension of one element is different from that of another element.

329.3 Including movable scraper:

This subclass is indented under subclass 329.1. Subject matter wherein an agitating element is intended to substantially engage and move relative to a wall of the mixing chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 52, for a mortar-type mixer having a scraper for removing material from a mixing chamber.
- 67, for a scraper in a mortar-type mixer for removing material from the wall of a mixing chamber.

- 221, for a scraper for moving material away from a wall of a rotatable mixing chamber.
- 309+, for a mixing apparatus including a scraper or wiper formed of a flaccid material or of bristles.
- 330.1 Axially directing blade (e.g., propeller, helix section, etc.):**
This subclass is indented under subclass 325.1. Subject matter wherein an agitating element is relatively thin compared to its other dimensions and is angularly positioned with respect to the rotatable shaft so as to produce movement of the material in a direction having a component parallel to the axis of rotation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
270, for a pump-type mixing apparatus including a propeller-type stirrer.
327.1+, and 327.4, for a stirrer having an agitating element pitched to move material axially or radially of the stirrer.
- 330.2 Blade detachably secured to hub:**
This subclass is indented under subclass 330.1. Subject matter wherein the rotatable shaft has an enlarged section configured to receive the blade in a readily removable manner.
- (1) Note. The blade may be secured to the hub by screws, for example.
- 330.3 Bowed or angled out of plane of rotation:**
This subclass is indented under subclass 330.1. Subject matter wherein the blade is curved or tilted to extend substantially out of the plane that is perpendicular to the axis of rotation of the shaft and that passes through a point of connection between the blade and the shaft.
- 330.4 Outwardly increasing width:**
This subclass is indented under subclass 330.1. Subject matter wherein the widest dimension of the blade measured generally perpendicularly to a radial line passing through the blade substantially continuously increases in a radially outward direction from adjacent the shaft to substantially the outer end of the blade.
- 330.5 Outwardly decreasing width:**
This subclass is indented under subclass 330.1. Subject matter wherein the widest dimension of the blade measured generally perpendicularly to a radial line passing through the blade substantially continuously decreases in a radially outward direction from adjacent the shaft to substantially the outer end of the blade.
- 330.6 Nonhorizontal, nonvertical axis of rotation:**
This subclass is indented under subclass 330.1. Subject matter wherein the axis of rotation of the shaft is neither vertical nor horizontal.
- 330.7 Convex trailing edge in plane of rotation:**
This subclass is indented under subclass 330.1. Subject matter wherein the trailing edge of the projection of the blade onto the surface of rotation of the blade is convex substantially throughout its length.
- 331 With specified mounting means:**
This subclass is indented under subclass 279. Subject matter wherein the stirrer has a particularly described means for either mounting the stirrer shaft to a drive means or for mounting the stirrer within the container, e.g., bearing means.
- (1) Note. Mere recitation of a mounting means broadly will not be considered specified mounting means.
- 332 Rectilinearly reciprocable stirrer:**
This subclass is indented under subclass 241. Subject matter wherein the stirrer moves bodily back and forth in a straight line so that at any instant all parts of the moving body moves in the same direction at the same rate.
- 333 In contact with mixing chamber:**
This subclass is indented under subclass 332. Subject matter wherein the stirrer, while moving back and forth for agitating, is in contact with at least a portion of the mixing chamber surface.
- 334 Plural:**
This subclass is indented under subclass 332. Subject matter wherein there is more than one stirrer and at least one of which moves bodily back and forth in a straight line.

- 335 On parallel axes:**
This subclass is indented under subclass 334. Subject matter wherein the stirrers have parallel axes.
- 336 STATIONARY DEFLECTOR (DIVIDING AND RECOMBINING TYPE) IN FLOW-THROUGH MIXING CHAMBER:**
This subclass is indented under the class definition. Apparatus and corresponding methods including a mixing chamber designed to receive the material at one end of a closed path and to discharge it at the other end in a continuous flow and a device positioned in the path so as to divert or separate a portion of the stream of material in the path relative to other portions and then permit the portions to recombine so as to commingle.
- (1) Note. The flow of material may, by disclosure, be either under the force of gravity or an applied force.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
150.1+, for a device of this subclass including specified feed means.
181.5, for a flow-through mixing chamber having a stationary deflector (not limited to the dividing and recombining type) and plural material feed means.
302+, for a stationary element in a mixing chamber cooperating with a rotating stirrer. See the search notes in subclass 302 for other locations of mixing apparatus having stationary agitating elements.
- SEE OR SEARCH CLASS:
138, Pipes and Tubular Conduits, subclasses 40+ for a conduit with a flow restrictor or deflector disclosed for use in forming emulsions of a plurality of fluids. Where such a conduit has additional combined features, such as means to feed material to the restrictor, etc., the patents have been placed in Class 366.
- 337 Angularly related flat surfaces:**
This subclass is indented under subclass 336. Subject matter wherein the deflector structure includes a plurality of flat surfaces, each positioned at an acute angle to the flow path and also in angular relation to each other.
- 338 Curved deflector surface:**
This subclass is indented under subclass 336. Subject matter wherein the deflector comprises surface extending along the path which are bent or twisted gradually and without angularity.
- 339 Helical ribbon or strand:**
This subclass is indented under subclass 338. Subject matter wherein the deflector is an elongated strip or slender rod twisted in a spiral shape extending along the path.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
227, for a helical-type deflector in a rotatable mixing chamber.
310, for a helical-type scraper in a stationary mixing chamber.
320, for a helical ribbon stirrer in a stationary mixing chamber.
- 340 Plate or block being apertured, notched, or truncated in shape:**
This subclass is indented under subclass 338. Subject matter wherein the deflector is a disk or solid body extending across the path and having an opening therethrough or an edge portion out away or indented so as to permit portions of the material to pass through.
- 341 STATIONARY MIXING CHAMBER:**
This subclass is indented under the class definition. Apparatus wherein the mixing chamber is in fixed position during the agitation and includes internal structure designed to deflect moving material within the chamber so as to cause its agitation.
- SEE OR SEARCH CLASS:
206, Special Receptacle or Package, subclasses 217+ for a drinking vessel and material packaged therein with a space provided for the addition of a liquid to be mixed with the material.
220, Receptacles, appropriate subclasses for details of a container structure.

342 AGITATOR:

This subclass is indented under the class definition. Subject matter comprising an agitating means, per se, not provided for in any of the preceding subclasses.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

108+, for a vibrator, per se, disclosed for use an agitating device.

129+, for an operator-supported stirrer.

SEE OR SEARCH CLASS:

416, Fluid Reaction Surfaces (i.e., Impellers), for an impeller which has no disclosed agitating function.

343 Stirrer:

This subclass is indented under subclass 343. Subject matter wherein the agitator is a stirrer.

344 With ejector:

This subclass is indented under subclass 343. Subject matter wherein the stirrer has a spindle fastened in a socket of motor drive means for the stirrer and including means for expelling the spindle from the socket.

345 Ambulant over material-supporting surface:

This subclass is indented under subclass 343. Subject matter wherein the stirrer is mounted on wheels, skids, tracks, or the like for movement along a surface intended to support material for agitation by the stirrer.

346 Track guided:

This subclass is indented under subclass 345. Subject matter wherein the stirrer is mounted on tracks.

347 COVER OR SHIELD FOR MIXING CHAMBER:

This subclass is indented under the class definition. Subject matter comprising a closure or protective device for the opening in a mixing chamber designed to cooperate with a stirrer in the chamber.

- (1) Note. The cover may be shaped to assist in the agitation or it may be provided with an aperture for the stirrer to extended therethrough into the chamber.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

154.1+, for a stirrer mounted in a removable container closure.

349, for a protective cover for a stirrer when not in use.

348 METHOD:

This subclass is indented under the class definition. Method which is not provided for in any of the preceding subclass.

349 MISCELLANEOUS:

This subclass is indented under the class definition. Apparatus which is not provided for in any of the preceding subclasses.

CROSS-REFERENCE ART COLLECTIONS

The following subclasses are collections of published disclosures pertaining to various specified aspects of the agitating art which aspects do not form appropriate bases for subclasses in the foregoing classification (i.e., subclasses superior hereto in the schedule), wherein original copies of patents are placed on the basis of proximate function of the apparatus. These subclasses assist a search based on remote function of the apparatus and may be of further assistance to the searcher, either as a starting point in further related fields of search inside or outside the class. Thus, there is here provided a second access for retrieval of a limited number of types of disclosures.

- (1) Note. Disclosures are placed in these subclasses for their value as references and as leads to appropriate main or secondary fields of search without regard to their original classification of their claimed subject matter.
- (2) Note. The disclosure found in the following subclasses are examples only of the indicated subject matter, and in no instance do they represent the entire extent of the prior art.

600 BODINE VIBRATOR:

Collection of patents to Mr. Bodine that pertain to agitating.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

108+, for mixers using a Bodine vibrator.

- 601 MOTOR CONTROL:**
 Patents pertaining to the stopping starting, or the regulation of motor speed.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 206, for motor control of mixing chamber that is removable from the stirrer and support.
 249, and 292, for motor control of stirrer within stationary mixing chamber.
- 602 AMALGAM MIXER, E.G., DENTAL FILLING:**
 Apparatus adapted to mix dental amalgam.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 197+, and 208+, for a mixing chamber that is removable from a support and moved to produce agitation of the material.
- 603 ANIMAL FOOD MIXER:**
 Apparatus used for the particular mixing of feed for animals.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 266, for feed mixers that operate as a pump-type mixer.
 293+, for plural stirrers for mixing animal food.
 319+, for screw-type stirrer for mixing animal food.
- 604 LATHER MIXER:**
 Mixer for the production of foam or lather.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 279+, for rotatable stirrer in stationary mixing chamber for producing lather or foam.
- SEE OR SEARCH CLASS:
 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, subclasses 9+ for continuous liquid phase colloid systems (e.g., foams, emulsions, suspensions, dispersions) 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.
- 605 PAINT MIXER:**
 Apparatus for the stirring of paint consisting of either a device for moving the paint container or a stirrer to be inserted into the container for mixing.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 208+, for apparatus for mixing paint by imparting movement to the container.
 241+, for a stirrer to be inserted into the container.
- SEE OR SEARCH CLASS:
 516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, subclasses 9+ for continuous liquid phase colloid systems (e.g., foams, emulsions, suspensions, dispersions) 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.
- 606 TRACTOR-MOUNTED MORTAR MIXING CHAMBER:**
 Apparatus including mortar mixing that is adapted to be mounted on and driven by a farm-type tractor.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 45+, for tractor-mounted mortar mixer tilt-able for deliver.
 54+, for tractor-mounted mortar mixer that is rotatable.
 64+, for tractor-mounted mortar mixer having a movable stirrer.
- 607 CHAIN-TYPE STIRRER:**
 Apparatus for mixing wherein either the mixing chamber or the stirrer have a chain element thereon for mixing.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

53+, for movable chamber having a chain element.

64+, for movable stirrer having a chain element.

608 STIRRER IN MIXING CHAMBER SIDE WALL:

This subclass is indented under the class definition. Subject matter comprising a mixing chamber having a bottom wall and an upwardly extending side wall and a stirrer extending through the side wall.

END