CLASS 343, COMMUNICATIONS: RADIO WAVE ANTENNAS

SECTION I - CLASS DEFINITION

A. This is the generic class for antennas for the transmission of radio wave energy through the natural media (i.e., air, earth, water, etc.) for point-to-point communication or for the reception of such transmitted radio wave energy.

B. In this class are apparatus and systems which constitute part of an antenna transmission or reception apparatus or system and which are limited to use in connection with the transmission and reception of radio wave energy, e.g., electromagnetic horns and arrays.

C. Exclusions:

1. This class excludes noncommunication applications involving radio waves, such as resiation by radio waves for therapeutic purposes or for measuring and testing a physical parameter where no communications or signaling is involved.

2. Also excluded from this class are systems, such as detector and receiver systems, oscillation generator systems, modulator systems, amplifier systems, which are used as component parts of radio wave energy transmission or reception systems but which are of more general utility.

3. This class also excludes communication by electromagnetic waves other than radio waves (e.g., by partial rays, compressional waves, etc.). Communication restricted to rays or visible light, heat, infrared, ultraviolet, X-rays, cathode rays, ions, gamma rays, and beta rays, as well as inductive coupling are excluded from this class.

See References to Other Classes, below.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

TELEDYNAMICS OTHER THAN SIGNALING:

See Class Definition, C, above for the radio wave energy systems for controlling apparatus and mechanism other than indicating or measuring instruments which are included in this class. See subclass 7 of this class and the search notes thereto for the miscellaneous systems for controlling apparatus other than indicating and measuring instruments which are classified in this class. See the classes specified under “SEARCH CLASS” below for a reference to some of the other classes which provide for radiant energy controlled devices and apparatus.

COMMUNICATIONS:

Many classes provide for devices, apparatus and systems useful in communicating information. For example, one class provides for means for displaying information by printed or painted cards, calendars, pictures, labels, tags and signs. Another class provides for recording systems and recorders, etc. Class 343 is primarily concerned with the information conveyed by means of radio wave energy signals and with radio wave energy teledynamics. Also see References with Other Classes below.

SIGNALING:

For the relationship of Class 343 to the signaling classes, see the classes referencing this section in References to Other Classes, below.

MEASURING AND TESTING:

This class includes some patents for measuring, detecting, and/or utilizing radio wave energy. The detection of objects, or the use of radio wave energy to measure distance, direction, and/or velocity of an object is included in this class when the only measurement is of the amplitude of the radio wave energy, or of the direction in which the energy is transmitted or the direction from which the energy is received, or where the duration of time the energy is being propagated is measured, or where only the detection of radio wave energy is involved. This class also includes the measurement of the amplitude or intensity of the radiated radio wave energy where the measurement is performed by detecting and measuring the energy. Antennas combined with structure for measuring the magnitude of the signal energy flowing in, to, or from the antenna, a significant relationship existing between the antenna and the measuring structure, are classified in subclass 703 of this class.

For other measuring and testing, see References to Other Classes, below.

SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

40, Card, Picture, or Sign Exhibiting, for means for displaying information by printed or painted cards, calendars, pictures, labels, tags and signs,

47, Plant Husbandry, subclass 1.3 for methods and apparatus for culture of plants by means of electricity, including radiating electrical energy.

73, Measuring and Testing, is the generic class for measuring and testing methods and apparatus. The search notes to the class definition of Class 73 should be consulted for other classes which provide for measuring and testing processes and apparatus. subclasses 570+ for miscellaneous apparatus for testing devices by means of vibratory forces (e.g., certain types of compressional waves), see indented subclasses 584+ where sound waves are used. Class 73 provides for measuring and testing methods and apparatus which involve a radiant energy test and a nonelectrical test. Class 136, Batteries: Thermoelectric and Photoelectric, subclasses 200+ for thermoelectric generators, particularly subclasses 213+ for radiation (e.g., infrared) promoters. (See Lines With Other Classes, "Measuring and Testing," above.)

89, Ordnance, subclasses 1 and 41 for apparatus designed to control and/or move a gun for aiming it towards a target, including such apparatus where radiant energy is utilized and subclass 1.5 for radiant energy actuated or controlled devices for releasing bombs, flares, etc., from aircraft.

91, Motors: Expansible Chamber Type, appropriate subclasses for expansible chamber motors controlled by radiant energy.

102, Ammunition and Explosives, subclass 384 for drop bombs with direction controlling means, including those controlled by radiant energy, subclasses 416+ and the subclasses specified in the notes thereto for explosive mines adapted to be fixed automatically, for firing device of the mine being actuated by electrical, magnetic, wave or radiant energy, and the ignitors, per se, for such mines; and subclass 214 for fuses, primers and igniting devices for explosives which involve the utilization of electrical, magnetic, wave, or radiant energy in their operation.

116, Signals and Indicators, is the generic class of mechanical (nonelectrical) signaling; subclass 137 is the generic subclass for mechanical sonic and supersonic generators for wave transmission; see subclasses 18+ for code signaling, including heliographic signaling. The signal in Class 116 may be of any type that appeals to any one or more of the senses, such as a bell, horn, whistle, semaphore, light shutter, explosive device or flag. The classes specified in the class definition of class 116 should be searched for other nonelectrical signaling systems. See the notes to Class 116 for the distinction between Class 116 and the electrical classes. Class 116 includes code signaling, including helios:graphic signaling. Class 116, subclass 27 provides for apparatus for the mechanical production and reception of sound vibrations transmitter through bodies of water (submarine signaling). (See Lines With Other Classes, "Signaling" above).

136, Batteries: Thermoelectric and Photoelectric, see Lines With Other Classes and Within This Class, Measuring and Testing, above.

137, Fluid Handling, appropriate subclasses for fluid flow control systems including radiant energy systems for valve actuation.

178, Telegraphy, includes in many of the subclasses patents where the sole disclosure is of a radiant energy telegraph system, but the claims are not limited to radiant energy transmission of the signals; see especially subclass 19 for handwriting and drawing transmission systems, subclass 22 for secrecy systems, subclass 43 for space induction systems, subclasses 50+ for multiplex systems, and subclasses 58+ for duplex systems, subclasses 66.1+ for miscellaneous systems using alternating current (including high frequency current) to transmit the signal (note that many of the patents in Class 178, subclass 66.1 are closely analogous to the patents in Class 375, subclasses 259+), and subclasses 371+ for miscellaneous telegraph receivers. Also see the appropriate subclasses in Class 178 for telegraph apparatus useful either in radio or wire telegraphy, for example, subclasses 118+, for receivers and subclasses 101+ for keys. (See Lines With Other Classes, "Signaling" above).

181, Acoustics, is the generic class for inventions in sound wave radiation, transmission or reception and instruments specific thereto; see subclasses 18 through 22 , for speaking tubes, subclasses 126+, for anatomic or prosthetic rela-

tion, and subclasses 177+, for megaphones. See the notes to Class 116 for other acoustical signaling systems. (See Lines With Other Classes" Signaling" above).

181, Acoustics, subclasses 101+, for mechanical means for geophysical exploration, subclasses 123+, for mechanical sound echo systems and subclass 125 for mechanical sound locating devices for determining the direction from which a sound proceeds. (See Lines With Other Classes, "Measuring and Testing," above.)

191, Electricity: Transmission to Vehicles, subclass 10, for systems for transferring energy from a roadway or other place to a movable vehicle by means of electromagnetic induction.

194, Check-Actuated Control Mechanisms, appropriate subclasses, provides for coin controlled radios. (See Lines With Other Classes, "Signaling", above.)

219, Electric Heating, subclass 553 provides for infrared ray generating apparatus.

244, Aeronautics and Astronautics, subclass 3.1 for control means for missiles and subclass 77 for systems for automatically controlling aircraft by means of electrical apparatus and radiant energy. Subclass 77 is the generic subclass for the automatic control of the steering of mobile craft in two or three dimensions where electrical means are utilized. See the search notes to subclass 77 in Class 244 for the other classes which provide for radiant energy controlled steering and for a statement as to the lines between the classes.

246, Railway Switches and Signals, Note that class 246 contains a number of subclasses relating to "inductive" control or actuation, i.e., where an inductive connection rather than a physical contact being made. subclass 8 provides for inductive telegraphy or telephony in train dispatching systems, subclass 63 for block signal systems having cab signal or train of the inductive type, subclass 194 for train control of the inductive type for controlling the train mechanism. Subclass 4, for train dispatching systems having a train carried signal or train control mechanism, the system including radiant energy control, subclasses 29+ for block signaling systems in which traffic control devices are controlled by radiant energy, see indented subclass 30 where radio energy is used, and subclass 189 for radiant energy control systems for controlling the engineer's brake valve on a train. (See Lines With Other Classes, Signaling, above).

250, Radiant Energy, subclasses 200 through 239 are the generic subclasses for photosensitive systems which are responsive to visible light and for apparatus used with photocells, subclass 250 provides for radio and microwave wavemeters for measuring the length or frequency of radio or microwaves, subclasses 281+ provides for methods and apparatus for the ionic separation and or analysis of material on the basic of the mass to electric change of ionic particles of the material being separated or analyzed, subclasses 306+ provides for methods and apparatus of inspecting solid or liquid material by charge particles, and subclasses 336.1+ provides for generic methods and apparatus for utilizing invisible ray energy, such as, cathode rays, ultraviolet rays, the radiations and emanations or radio-active substances, for measuring and detecting purposes; and subclasses 492.1+ is the generic place for methods and apparatus utilizing invisible ray energy, such as ultraviolet and infrared rays. (also see Lines With Other Classes, "Measuring and Testing," above.)

250, Radiant Energy, contains patents for signaling by means of radiant energy; see appropriate subclasses for the generic transmission or reception of energy propagated in the form of electromagnetic waves of subatomic, atomic or molecular particles. (See Class Definition, Statement of Class Subclass Matter.)

251, Valves and Valve Actuation, subclasses 129+, for electrical valve actuation.

307, Electrical Transmission or Interconnection Systems, subclass 117 for switching systems controlled by radiant energy.

313, Electric Lamp and Discharge Devices, appropriate subclasses, provides for the structure of electronic tubes.

314, Electric Lamp and Discharge Devices: Consumable Electrodes, subclass 63 for arc lamps and other similar consumable electrode discharge devices where the feeding of the electrode is controlled by radiant energy, usually light or radiant heat.

315, Electric Lamp and Discharge Devices: Systems, subclass 34, provides for radio tubes and other electronic tubes which have an antennae within the envelope of the tube or otherwise structurally combined with the tube. (See Lines With Other Classes, Signaling, above).

315, Electric Lamp and Discharge Devices: Systems, see Lines With Other Classes and Within This Class, Signaling, above. Class 315 provides in subclasses 1+ for circuits for energizing cathode-ray tubes, subclass 10 for radiant energy controlled cathode-ray tube circuits, subclasses 32+, for electronic tubes which have a circuit element, such as a switch, inductance, etc., built into and structurally combined with the electronic tube structure, and in subclasses 32 to 363 for systems where a gas or vapor tube or an electric lamp is energized by or controlled by radiant energy, including radio waves, see subclasses 149+ for radiant energy controlled electric lamp and gas or vapor type electric space discharge device systems.

318, Electricity: Motive Power Systems, subclass 16 for electric motor systems where the motor is controlled or supplied by space transmitted electromagnetic or electrostatic energy (including radio energy), subclass 460 for electric motor systems controlled by sound or supersonic vibrations, subclass 480 for electric motor systems controlled by radiant energy (e.g., light).

324, Electricity: Measuring and Testing, is the generic class for methods and apparatus for testing to determine electrical properties by electrical means; subclasses 323+, especially subclasses 332+ and 344+ provide for ore detection determination by electrical means, including the use of radio waves, except such methods and apparatus which involve the use of reflected or otherwise returned radio waves, the excepted subject matter being in this class (343), subclasses 5+. Class 324 provides for electrical testing methods and apparatus which include a test by means of radio waves and another electrical test. (See Lines With Other Classes, "Measuring and Testing," above.)

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous circuits supplying current or potential to active devices such as an electron tube or circuits controlling the current or potential utilizing an active device such as an electron tube.

329, Demodulators, appropriate subclasses, for various types of demodulators for extracting the intelligence modulated on a high frequency wave.

330, Amplifiers, appropriate subclasses, for the various types of amplifier systems.

331, Oscillators, appropriate subclasses, for electric oscillation generators having utility in the radiant energy communication systems of Class 343.

332, Modulators, appropriate subclasses, for modulators, per se. (See Lines With Other Classes, Signaling, above).

333, Wave Transmission Lines and Networks, provides for wave transmission lines or networks, which may be used for communication purposes wherein the wave energy is guided or constrained by a wave propagating medium of appreciable electrical length with respect to the wave length of the propagated energy. For example, subclasses 1+ provides for plural channel systems and subclasses 236+ provides for single channel long lines having distributed electrical parameters, such as parallel conductors, wave guides, and shielded lines. This class also contains systems and networks useful in communication with radiant energy. See particularly subclasses 101+ for branched circuits with switching, subclasses 109+ for directional couplers, subclasses 117+ for hybrid type networks, subclass 13 for resonator type breakdown discharge systems, e.g., T-R or R-T systems, subclass 22 for dissipating terminations for long lines, subclasses 24+ for coupling networks including filters, equalizers, delay networks, and impedance matching networks, and subclass 81 for attenuators. (See Lines With Other Classes, Signaling, above).

334, Tuners, appropriate subclasses for tuner networks adapted for use in radiant energy systems.

340, Communications: Electrical, is the generic class for electric signaling. See subclasses 384.1+ for electrically operated audible signals such as bells and whistles. (See Lines With Other Classes, Signaling, above).

342, Communications: Radio Waves Systems and Devices (e.g., Radar, Radio Navigation), appropriate subclasses for whole radio wave systems and devices, or radio wave system or device components other than antennas. See the "SEARCH CLASS" references in Class 342 for the lines between radio wave communication and the subject matter of other classes. (See Class Definition, Statement of Class Subclass Matter.)

345, Computer Graphics Processing and Selective Visual Display Systems, subclasses 418 through 475 for computer graphics processing.

346, Recorders, for recording systems and recorders, etc.

348, Television, appropriate subclasses for television systems whether the signals are transmitted by radiant energy or otherwise. (See Lines With Other Classes, Signaling, above).

356, Optics: Measuring and Testing, provides for measuring instruments and processes involving reflection, refraction, chromatic effects and other optical properties of light and materials, that is, for devices which utilize visible light and optical principles for the measurement of angles, distances, chromatic effects and the intensity of light, flaw analysis, and fiducial instruments not provided for elsewhere; see subclasses 3+ for range and height finders which utilize visible light, subclasses 27+ for velocity or velocity and height measuring apparatus, subclass 29 for the measurement of relative velocity of a remote object by means of apparatus having an optical element or a reticle, and subclasses 138+ for the measuring of angles or axial alignment by means of visible light. See subclasses 625 and 388+ for the mensuration or configuration analysis of areas, volumes or linear measurements of articles or indefinite length materials or the measurement of distance traveled by a scale or optical grid displaced relative to a remote fiducial mark. Search subclasses 43+ optical pyrometers for the determination of the temperature of bodies or the temperature of light radiation for photos: graphic purposes by means of relative intensity of radiation, color, or incandescence comparison and subclasses 213+ for apparatus to measure the intensity of light generally. (See Lines With Other Classes, “Measuring and Testing,” above.)

358, Facsimile and Static Presentation Processing, appropriate subclasses facsimile systems whether the signals are transmitted by radiant energy or otherwise. (See Lines With Other Classes, Signaling, above).

361, Electricity: Electrical Systems and Devices, subclasses 173+ for photocell controlled relay and electromagnet circuits.

362, Illumination, appropriate subclasses for radiant energy controlled illuminating devices, see especially subclass 276.

367, Communications, Electrical: Acoustic Wave Systems and Devices, is the residual class for electroacoustic wave signalling devices. (See Lines With Other Classes, “Signaling”, above).

367, Communications, Electrical: Acoustic Wave Systems and Devices, appropriate subclass for means to transmit and receive sonic or supersonic waves. (See Class Definition, Statement of Class Subclass Matter.)

367, Communications, Electrical: Acoustic Wave Systems and Devices, provides for apparatus for detecting objects and/or determining their distance and/or direction which are provided with means to transmit and receive sonic or supersonic waves, the sonic or supersonic waves being either generated or received by electrical means. See subclasses 87+ for echo systems, subclasses 118+ for distance or direction finding, and subclasses 131+ for underwater systems. Note that the acoustics class has similar apparatus. (See Lines With Other Classes, “Measuring and Testing,” above.)

369, Dynamic Information Storage or Retrieval, subclasses 6+ for a combined radio and phonography systems. (See Lines With Other Classes, Signaling, above).

374, Thermal Measuring and Testing, subclass 122 is drawn to determining the temperature of a body by use of a microwave arrangement to measure the thermal radiation emitted by the body. (See Lines With Other Classes, “Measuring and Testing,” above.)

375, Pulse or Digital Communications, appropriate subclass for apparatus for the transmission or reception of pulses into or from free space, per se. (See Class Definition, Statement of Class Subclass Matter.)

378, X-Ray or Gamma Ray Systems or Devices, subclasses 44+, 51+, and 70+ for X-ray systems used for testing. (See Lines With Other Classes, “Measuring and Testing,” above.)

382, Image Analysis, appropriate subclass for pattern recognition or image processing.

431, Combustion, subclass 79 for a fuel burner controlled by a photoelectric type sensor.

434, Education, Demonstration, and Cryptography, subclasses 239+ for devices for instructing or training in the characteristics or operation of navigational aids, such as radio beacons, blind landing systems, direction finders, etc.; subclasses 1+ for devices for instructing or training in characteristics or operation of object detecting systems, such as radar or sonar systems; and subclass 222 for patents relating to instruction in the art of signaling, including instruction in the operation of radio transmitters and receivers.

455, Telecommunications, for analog modulated carrier wave and light wave communications.

505, Superconductor Technology: Apparatus, Material, Process, subclasses 150+ for high temperature (T_c > 30 K) superconducting devices, and particularly subclass 201 for antennas.

700, Data Processing: Generic Control Systems or Specific Applications, subclasses 1 through 89 for generic data processing control systems; and subclasses 90-306 for particular application of data processing systems or calculating computers.

701, Data Processing: Vehicles, Navigation, and Relative Location, subclasses 200+ for the application of a computer in the area of navigation, particularly subclasses 207+ for position determining equipment, and subclasses 300+ for determining the relative location between two points. (See Lines With Other Classes, "Measuring and Testing," above.)

704, Data Processing: Speech Signal Processing, Linguistics, Language Translation and Audio Compression/Decompression, subclasses 200+ for artificial intelligence systems that process speech signals.

706, Data Processing: Intelligent Processing Systems and Methods, various subclasses for artificial intelligence systems that represent, apply, and acquire knowledge.

708, Electrical Computers: Arithmetic Processing and Calculating, subclasses 1+ for hybrid computers; subclasses 100+ for digital calculating computers; and subclasses 800+ for analog computers.

715, Data Processing: Presentation Processing of Document, Operator Interface Processing, and Screen Saver Display Processing, subclasses 700 through 866 for computer operator interface processing.

SECTION IV - GLOSSARY

ACTIVE ELEMENT

An element or network whose energy output is modified due to the presence of a source of energy in the element or network (other than the mere signal energy which passes through the network) or an element or network in which the energy output from a source of energy is controlled by the signal input.

ANTENNA ARRAY

A plurality of active antennas coupled to a common source or load to produce a directive radiation pattern. Usually the spatial relationship also contributes to the directivity of the antenna.

ANTENNA COMPONENT

A portion of the antenna performing a distinct function and limited for use in an antenna, as for example, a reflector, director or active antenna.

ANTENNA COUNTERPOISE

Structure of conductive material most closely associated with ground but insulated from or capacitively coupled to the natural ground, and aiding in the function of the natural ground, particularly where variations or limitations of the characteristics of the natural ground interfere with its proper function, and such structure being connected to the terminal of the signal receiver or source opposing the active antenna terminal.

ANTENNA COUPLING NETWORK

A passive network (which may be resistive, inductive or capacitive or any combination thereof) for transmitting the signal energy between the active antenna and a source or receiver of such signal energy.

ANTENNA GROUNDING STRUCTURE

Ground, or structure most closely associated with or simulating ground which is connected to the terminal of the signal receiver or source opposing the active antenna terminal, (i.e., the signal receiver or source is interposed between the active antenna and this structure), for establishing a reference potential level for operating the active antenna.

ANTENNA INHERENT REACTANCE

This includes not only the distributed reactance of the active antenna but also the natural reactance due to its location and surroundings, as for example, the capacity relation inherent in the position of the active antenna relative to ground.

ANTENNA LEAD-IN

A conductive means (transmission line, feed line) for conveying the signal energy between the active antenna and the signal source or receiver, and extending directly from the active antenna towards the source or receiver.

ANTENNA SHIELD

A conductive or low reluctance structure, such as a wire, plate or grid which is adapted to be placed in the vicinity of an active antenna to reduce, as by dissipation through a resistance or by conduction to ground, undesired electromagnetic radiation, or electric or magnetic fields, which are directed toward the active antenna from an external source or which emanate from the active antenna.

ANTENNA TUNING

Adjusting an inductance or capacity combined with the active antenna but distinct and separate therefrom, the inductance or capacity providing a reactance which combines with the inherent reactance of the active antenna to establish a resonance in a circuit including the active antenna, this resonance being at a frequency other than the natural electrical resonant frequency of the active antenna, adjustment of the inductance or capacity changing this resonance; or adjusting the length of an electrically long linear antenna to alter the electrical resonance of the antenna.

COMMUNICATION

The conveying or transferring of information; specifically a system, as radio, telephone, telegraph for conveying or transferring information. For a general statement of the classes which include communication devices, apparatus and systems,see section V below.

DIRECTOR

A conductive (usually metallic) structure (e.g., a rod) which reradiates into free space impinging electromagnetic radiation (waves) coming from or going to the active antenna, the velocity of the reradiated wave having a component in the direction of velocity of the impinging wave, thereby to modify the radiation pattern of the active antenna, there being no significant potential relationship between the active antenna and the conductive structure.

DISTANCE

The space between two points, which may be immediately juxtaposed or widely spaced.

ELECTROMAGNETIC WAVE POLARIZATION FILTER

Structure which acts directly on the electromagnetic wave to filter out wave energy of an undesired polarization and to pass wave energy of a desired polarization.

ELECTROMAGNETIC WAVE REFRACTOR

Structure which is shaped or positioned to delay or accelerate transmitted electromagnetic waves, passing through such structure, an amount which varies over the wave front, to alter the direction of propagation of the waves emitted from the structure with respect to the waves impinging on the structure, or to bring the wave to a focus, or to alter the wave front (such as to convert a spherical wave front to a planar wave front or vice versa).

FREE SPACE

Space where the movement of energy in any direction is substantially unimpeded, such as interplanetary space, the atmosphere, the ocean and other large bodies of water or the earth.

LOADED ANTENNA

An active antenna having an elongated portion of appreciable electrical length and having additional inductance or capacity directly in series or shunt with the elongated portion so as to modify the standing wave pattern existing along the portion or to change the effective electrical length of the portion.

MESSAGE

A signal used to convey intelligence, such as telegraph signals or telephone signals (e.g., speech). Message is used in more limited sense than signal for the purpose of classification in this class in that signal includes the transmission of control impulses for operation mechanism other than mere signal reproducers.

ORIENTING

Changing the direction of the antenna beam.

PARASITIC ELEMENT

A conductive (usually metallic) structure (e.g., rod) which reradiates into free space impinging electromagnetic radiation (waves) coming from or going to the active antenna, the velocity of the reradiated wave having a component which is in the same direction (direc-

tor) as, or in the opposite direction (reflector) to, that of the velocity of the impinging wave.

RADIANT ENERGY

The energy (partially kinetic, partially potential) associated with waves produced in free space by a space by a source of energy, as light waves, electromagnetic radiations (including radio wave), neutron and similar radiation, subsonic, supersonic and sonic waves.

RADIATE

The emanation of energy into free space.

RADIO OR HERTZ WAVE

An electromagnetic wave whose frequency spectrum extends over a range from somewhat above the frequency of audible sound waves to somewhat below the frequency of heat and light waves. Values of 10 kilocyles and 30,000 megacyles have been given as the lower an upper limits of the range for radio waves, although values exist beyond these limits. Radio waves as here defined exclude compressional waves, light waves, heat waves, infrared waves, ultraviolet waves, X-rays, cathode rays, gamma rays, and ion beams. The radio waves are produced by oscillations of electric change in an antenna.

REFLECTOR

A conductive structure, usually metallic (e.g., screen, rod or plate) which reradiates back into free space impinging electromagnetic radiation (waves) coming from or going to the active antenna, the velocity of the returned wave having a component in a direction opposite to the direction of velocity of the impinging wave, thereby to modify the radiation of the active antenna, there being no significant potential relationship between the active antenna and the conductive structure.

RESTRICTED SPACE

A space or medium which tends to confine the energy within specified boundaries along a predetermined path, as wave guides, hollow resonators, conductive wires.

SCANNING

Repeatedly moving the antenna beam over an area in space.

SIGNAL

Control impulse, wave energy, intelligence or message conveyed, such as a sign, noise indication agreed upon, understood and used to convey intelligence at a distance.

SWEEPING

Moving the antenna beam repeatedly along a single line (which may be straight or curved) in space.

TELEGRAPHY

The transmission to a distance of signals, unlimited with respect to the extent of the message communicated, by the utilization of energy, the elements of the message being selected or composed at will according to a prearranged code.

TELEPHONY

The conversion of spoken or sound waves into energy which is transmitted a distance and reconverted into sound waves for reproduction of the speech or sounds.

SUBCLASSES

700 This subclass is indented under the class definition. Subject matter and limited by claimed subject matter to coupling electrical energy between free space and restricted space, i.e., the radiation or collection of such energy together with its transmission to or from a transmitter or receiver, and not otherwise classifiable.

(1) Note. The free space may be interplanetary space, atmospheric space, the earth, or large bodies of water, and the electrical energy therein is radio wave energy covering the range between long and extremely short waves. Excluded are visible light, infrared and ultra violet radiation, X-rays, and gamma rays, as well as compression wave energy, either sonic or supersonic. The restricted space may be either a wire transmission line or a wave guide type line, and the electrical energy flowing therein is pulsating at the frequency of the corresponding free space energy, which is established by or establishes the energy flowing in the wire transmission line or wave guide.

(2) Note. Since any conducting mass may function as a radiator or collector of radio wave energy, the subject matter classified here is specialized for use as an antenna. The antennas as here classified are formed as a passive conducting mass, which may be in the form of a metallic current conductor, wave guide, or space discharge. This mass in use is in direct engagement with free space to emit or collect radio wave energy to or from free space, and is coupled or connected to a source of energy or to a load. To act as an antenna the mass usually has a particular shape of dimension, or may have electrical circuit elements, namely, resistance inductance, or capacity, associated therewith. Included herein are devices designed to operate as an antenna, but involving no particular structure and claimed in combination with other electrical means, when no other class provides for the claimed subject matter. See the Notes to this subclass, below.

(3) Note. Combinations of an antenna and additional nonperfecting structure, i.e., structure having an added purpose or independent utility other than to perfect the antenna, are classified as follows:

A. Combinations of an antenna and a diverse type art device (i.e., nonradio device), such as an aircraft, water-borne device, vehicle, or lamp, for example, wherein the antenna is claimed by name only in combination with details of the device, there being no significant relationship between the nominal antenna and the diverse type art device, are generally not classified in this or indented subclasses but in the appropriate class taking such device.

B. Combinations of an antenna and a diverse type (i.e., nonradio device) art device including significant antenna structure or wherein a significant relationship exists between the antenna and the diverse type art device are classified in this and the indented subclasses, where the only structure of the diverse type device recited is structure which permits the antenna to function as such (e.g., supports the antenna, forms a ground plane or reflector for the antenna, or makes a specific type antenna necessary for use with the device). For example, the combination of an antenna with a radio cabinet, aircraft, watercraft, or vehicle, there being a significant relationship between the antenna and the associated structure, is classified in indented subclasses 702, 705+, 709+, and 711+, while subclasses 720+ is the residual subclass for this subject matter. Where the other device is recited merely in broad terms for such purposes as background for the antenna or supporting the antenna, classification is in the appropriate indented subclasses, such as in subclasses 878+ where the other device is a support.

C. Generally, where the antenna itself is designed to function also as another device and significant antenna structure is recited, as for example, a venetian blind or water sprinkler, classification is in this and the indented subclasses, subclasses 708, 710, 712, and 720+ being especially pertinent. Where the antenna is broadly claimed, and the other device is significantly claimed, classification is with the other device. For example, a rubber mounted vehicle bumper which may operate as an antenna is classified in Class 293, Vehicle Fenders, subclass 88.

D. Combinations of an antenna and additional electronic structure or system are generally classified with the combination. For example, an antenna and a cabinet containing some radio structure other than the antenna would be classified in Class 455, appropriate subclasses, especially subclasses 269+. However, where detailed antenna structure is combined with additional electronic structure, nominally recited, classification is in this and the indented subclasses. For example, such terms as transmitter, receiver, signal source, and load are considered nominal recitation of the other structure. A plurality of antennas combined with additional electronic structure

nominally recited is considered as detailed antenna structure with a nominal electronic structure, and is classified in this and the indented subclasses. A plurality of such nominal elements, such as a plurality of transmitters, a plurality of receivers, or a transmitter and receiver, are generally considered nominal structure, which when combined with detailed antenna structure are classified in this and the indented subclasses. When the antenna is combined with a nominal transmitter and receiver forming a duplex system, classification is in Class 370, Multiplex Communications, subclasses 276+ as a duplex system. The combination of an antenna and electric space discharge device may be in this class (343) where the combination performs the functions there defined. Where the antenna includes an electric discharge device, the discharge serving as a portion of the antenna coupling, and wherein the combination performs no function classified elsewhere, classification is in this class (343) subclass 701. See Class 315, subclass 34 for a space discharge device having an antenna within or integral therewith and Class 325, especially subclass 384 for means for coupling antennas to radio receivers by means of electron tubes.

(4) Note.

A. Combinations of an antenna within the class definition and additional structure for the purpose of improving or perfecting the antenna in the performance of its primary function, which is the radiation or collection of radio wave energy together with the transmission of such energy to or from the transmitter or receiver, are classified in this and the indented subclasses where the structure claimed includes significant antenna structure or is more than is provided for in other classes. Examples of such subject matter are found in indented subclasses 704, 872, 878, and 904; subclass 904 being the residuary home for such subject matter.

B. Combinations of an antenna with no significant antenna structure with perfecting structure, such as a support, connector or leadin, the combination not being peculiar to antennas (i.e., the combination has more general application) are classified in a more general class if such exists. For example, the structure of a metallic antenna rod, whether insulated or not, unlimited by modifications for radiating purposes, together with a support is classified in Class 52, Static Structures (e.g., Buildings), subclasses 108, 109, 110, 111+, 632, 633+, and 720+. Where the antenna is in the form of a generalized conductor, whether insulated or not, combined with lead-in or connector means, classification is in Class 174, Electricity: Conductors and Insulators. Where a nominal antenna is formed as a helical extensible spring, classification is in Class 267, Spring Devices, subclass 74. Where a nominal antenna is formed as a rod of adjustable length with a joint for permitting such adjustment, classification is in Class 287, Rod Joints or Couplings, subclass 58.

C. Combinations of a nominal antenna or a nominal reflector together with significant structure used with the antenna for supporting, moving, signaling some condition of the antenna, etc., are not classified in this or the indented subclasses where some other class provides for the claimed subject matter (e.g., the support class provides for the significant support structure and will also take the thing supported by name only), even though the combination improves or perfects the operation of the antenna or reflector. Such subject matter is found in the classes which provide for the significant structure used with the nominal antenna or reflector. Situations of this nature are as follows (for an exception, see (11) Note, below):

1. The combination of a nominal antenna or reflector together with significant mechanism for moving the antenna or reflector, is classified in Class 74,

Machine Element or Mechanism, especially subclass 1, where the mechanism is for scanning, sweeping or orienting the antenna. The broad recitation of a motor for driving the mechanism in this combination does not preclude classification in this class (74).

2. The combination of a nominal antenna or reflector together with an electric motor and motor control means for moving the antenna or reflector, is classified in Class 318, Electricity: Motive Power Systems. See also the class definition of Class 318.

3. Combinations of a nominal antenna or reflector together with significant structure for providing a signal, indication or alarm indicative of some condition of the antenna or reflector, are classified in Class 116, Signals and Indicators, where the signaling structure is mechanical in nature, and in Class 340, Communications: Electrical, where the signaling structure is electrical in nature. This reference to Classes 116 and 340 does not include signals, indicators or alarms actuated by the radio wave energy collected or transmitted by the antenna. For example, Class 340 includes electrical signaling means for indicating the direction in which the antenna is oriented, but Class 343, subclasses 100+, includes direction finding radio systems.

4. Combinations of a nominal antenna together with significant structure for transmitting electrical energy, which may be signal energy, thereto and permitting movement of the antenna are classified in the appropriate subclass of Class 191, Electricity: Transmission to Vehicles. Where a flexible extension for transmitting electrical energy between relatively moving parts is combined with a reel, classification is in subclasses 12.2+ of Class 191. The addition of a drag to any of the combinations involving Class 191 as here set forth is sufficient to exclude such subject matter from Class 191. For classification of such combinations, see paragraph 6 under this section, subclass 707 below, and also the reference to Class 244, Aeronautics, under “SEARCH CLASS”, below.

5. Combinations of nominal antennas together with a support are classified in Class 211, Supports: Racks, where the support involves frame structures or a plurality of supports, or supports a plurality of antennas; and in Class 248, Supports, where the support is a single support or supports a single antenna.

6. Combinations of a nominal antenna together with a reel are classified in Class 242, Winding, Tensioning, or Guiding.

7. Combinations of a nominal antenna together with aircraft structure along with such elements as a fair lead, a drag on the free end of the antenna, and a reel or other extending and retracting structure are classified in Class 244, Aeronautics, subclass 1.

8. Combinations of a nominal antenna together with significant electrical connector or terminal structure are classified in Class 439, Electrical Connectors.

(5) Note. Subcombinations of an antenna which are not otherwise classified and are specialized for use in an antenna are classified in this and indented subclasses. Examples of such subject matter are antenna components, such as reflectors and directors. Radio wave lenses, refractors and polarizing converters, which are usually associated with an antenna or a wave guide, are also classified here.

(6) Note. Subcombinations merely amenable to use in an antenna are classified with the subcombination. For example, stock materials and other fabricated materials which may be used in making an antenna are classified in such classes as 28, Textiles: Manufacturing, 29, Metal Working, 138, Pipes and Tubular Conduits, and 139, Textiles: Weaving and 245, Wire Fabrics and Structure. See the Search Notes under subclasses 897,

900 and 907 below for a field of search for such materials.

(7) Note. The electrical energy coupled by the antennas of this and the indented subclasses is ordinarily signaling energy for such purposes as communication and telemetering. Also included are antennas and reflectors which are analogous in structure to those used in communication and telemetering. Many other classes provide for apparatus for treating persons or materials with radiated electromagnetic waves and include antennas and reflectors which are specialized for such use. See, for example, Class 422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 221+ for processes and apparatus for preserving, disinfecting and sterilizing, which may involve electromagnetic waves; Class 99, Foods and Beverages: Apparatus, subclass 451, for apparatus for treating foods with electromagnetic waves. Class 128, Surgery, particularly subclasses 404+, for electrical applicators for treating the human body; Class 134, Cleaning and Liquid Contact With Solids, subclass 1, for cleaning and liquid contact with solids involving a electromagnetic wave energy; Class 204, Chemistry: Electrical and Wave Energy, appropriate subclasses, for chemical processes involving electromagnetic wave energy; Class 219, Electric Heating, subclass 10.55, for structure for heating a device or material by subjecting it to a field of electromagnetic wave radiation; Class 250, Radiant Energy, subclasses 493+, for structure generating and applying ray energy; and Class 426, Food or Edible Material: Processes, Compositions, and Products, subclasses 234, 235, 236, and 237+, for processes involving the application of electromagnetic waves in the treatment of edible material.

(8) Note. There are other classes which provide for structures which project or extract to or from space, earth, or water signaling energy which is wave energy and may be in the form of electromagnetic wave energy (other than radio waves); and such subject matter is not classified in this and the indented subclasses. For example, this subject matter may be found in the following classes and subclasses: 116, Signals and Indicators, subclasses 18+ for visual or audible code signaling, subclass 27 for submarine sound signaling, and subclasses 137+ for horns, whistles and compressional wave generators for signaling; 178, Telegraphy, subclass 43 for space induction telegraph systems; 181, Acoustics, appropriate subclasses for acoustical signaling systems and subclass 175, for sound modifying means; 200, Electricity: Circuit Makers and Breakers, subclasses 61.01 and 61.02 for electric circuit makers and breakers responsive to sound and light respectively; 246, Railway Switches and Signals, subclasses 8, 63 and 194 for inductive type railway signaling systems; 336, Inductor Devices, appropriate subclasses, for the structure of inductor devices, per se, which may be used in inductive type signaling systems; 340, Communications: Electrical, subclasses 4+ for under water compressional wave signaling systems, and especially subclasses 8+ for compressional wave transducers; subclasses 15.5+ for earth propagated compressional wave signaling systems; subclasses 366+ for visual electrical signaling; and subclass 384.1 for audible electrical signaling; 359, Optics: Systems (Including Communication) and Elements, subclasses 109+ for light wave communications.

(9) Note. Communication or signaling systems including an antenna as an element or subcombination are classified with the system. Such communication systems which may include an antenna as an element or subcombination thereof are classified in Class 246, Railway Switches and Signals, subclass 30 for railway block-signal systems involving Hertzian waves (See also the reference to Class 246 in References to Other Classes, in the Class Definition, above); Class 250, Radiant Energy, for radiant energy systems which may include an antenna (See also the references to Class 250 in Lines

With Other Classes and Within This Class, Signaling, and Measuring and Testing, above; and References to Other Classes, above, in the class definition of this class (343), and under the Notes to this subclass (700); Class 318, Electricity: Motive Power Systems, subclasses 16 and 480 for motor control systems involving radiant energy; Class 340, Communications: Electrical, subclasses 189+ and 224 for signaling systems involving radiant energy; and this class (343) subclasses 5+ for reflected and/or otherwise returned wave systems, subclasses 100+ for directive systems; Class 370, Multiplex Communications, for duplex and multiplex systems.

(10) Note. Antennas within the subclass definition combined with a lightning arrester are classified in subclass 904 of this class. Lightning arresters generally are classified in Class 361, Electricity: Electrical Systems and Devices, subclass 40 for lightning arresters. Lightning arresters where the only structure is an arc or spark gap are classified in Class 313, Electric Lamp and Discharge Devices. Lightning arresters combined with thermal switches are classified in Class 200, Electricity: Circuit Makers and Breakers, subclass 115.

(11) Note. As between Class 333, Wave Transmission Lines and Networks, and this and indented subclasses, the combination of an antenna and its coupling network, whether single or plural channel, where the antenna is only nominally recited, is classified in this and the indented subclasses.

(12) Note. As between loop antennas and the inductor devices of Class 336, Inductor Devices, the claiming of an antenna by name only or structure peculiar to antennas together with inductor structure would classify the patent in this class (343), subclasses 700+, and particularly subclasses 866+. If the disclosure is a loop antenna, but the claims recite merely an inductor device, classification is in Class 336.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 600+, for a method of making an antenna or other wave-energy “plumbing” device not elsewhere classified.

52, Static Structures (e.g., Buildings), appropriate subclass for a residual elongated or openwork structure which may be disclosed or merely defined as an antenna, particularly subclass 40 for a shaft or tower with an article support, 108 for a strip-like unit which is reversibly flexible and rigid, 110 for an elongated member attached to a vehicle shell, 111+ for a mechanism operated or relatively movable assembly, 632 for an axially extensible shaft or openwork, 633+ for a residual openwork structure, e.g., tower, mast, grating, etc., and 720+ for a residual rigid elongated structure.

60, Power Plants, appropriate subclasses for fluid actuated devices which may be used for extending or retracting an antenna to its operative or inoperative position.

74, Machine Element or Mechanism, for mechanisms for controlling the position of an antenna, and particularly subclass 1 for mechanisms for imparting scanning, sweeping or orienting motion to an antenna.

99, Foods and Beverages: Apparatus, subclass 451, for apparatus for treating foods with electromagnetic waves.

114, Ships, subclass 311 for drags or sea anchors.

116, Signals and Indicators, for mechanical signaling or indicating structure which may be used with an antenna.

134, Cleaning and Liquid Contact With Solids, subclass 1 for cleaning processes including application of electrical, radiant or wave energy to the work.

139, Textiles: Weaving, subclass 425 for fabric materials including metal which may be used as an antenna.

174, Electricity: Conductors and Insulators, subclass 3 for lightning rod conductor structure; subclasses 6 and 7

for earth grounds, in general, which may be used with antennas; subclass 45 for towers, poles, or posts for supporting overhead conductors; subclasses 68.1-136 for cables and conductors which may be used in antennas; subclasses 137+ for antenna insulators, particularly subclasses 151+ for antenna insulators through a wall or plate; and subclasses 350-397 for anti-inductive structures involving a shield or screen.

188, Brakes, subclasses 378+ for vibration dampers which use the inertia of a damping mass to dissipate motion; and subclass 381 for dampers using friction between damper elements to dissipate motion.

191, Electricity: Transmission to Vehicles, for means for transmitting electrical energy between relatively moving parts, one of which may be a movable antenna, and particularly subclasses 12.2+ where a reel is involved, and subclasses 22+ where a conductor presenting a substantially continuous exposed surface along the path of movement for contact with a collector is involved.

200, Electricity: Circuit Makers and Breakers, for structure adapted for switching signal energy to or from an antenna.

204, Chemistry: Electrical and Wave Energy, for electrical or wave energy processes and apparatus.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, appropriate subclasses for electrolytic processes and selected electrolytic products.

211, Supports: Racks, for frame structure supporting means which usually involve a plurality of supports or a support for a plurality of articles which may be antennas.

219, Electric Heating, subclasses 600+ for inductive heating, subclasses 678+ for microwave heating, and subclasses 764+ for capacitive dielectric heating.

242, Winding, Tensioning, or Guiding, subclasses 370+, particularly subclasses 390.2, 390.3, and 917 for a reeling device on which a flexible antenna may wound.

244, Aeronautics and Astronautics, subclass 1 for miscellaneous aircraft structure including fairlead structure, in combination with a wire or cable, which may be a trailing antenna, and which may include a drag at the free end of the wire or cable.

246, Railway Switches and Signals, subclasses 8, 63, and 194 for inductive signaling systems which may involve inductive coupling devices similar to loop antennas; and subclass 30 for Hertzian wave systems involving antennas. See also the reference to Class 246 under References to Other Classes in the class definition of this class (343).

248, Supports, for supporting structure usually involving single supports or supporting a single article which may be an antenna.

293, Vehicle Fenders, subclass 136 for vehicle bumpers with rubber mounting means, which may be used as antennas.

307, Electrical Transmission or Interconnection Systems, for miscellaneous electrical transmission or interconnection systems not otherwise classified. See particularly subclasses 11+ for plural load systems, subclasses 43+ for plural supply systems, subclasses 89+ for anti-induction systems, and subclasses 112+ for switching systems.

312, Supports: Cabinet Structure, subclass 7.1 for radio type cabinets.

315, Electric Lamp and Discharge Devices: Systems, subclass 34 for the structural combination of an electric discharge device and an antenna, integrally united.

318, Electricity: Motive Power Systems, for motor control systems which may be used for controlling the position of antennas, particularly for such purposes as scanning, sweeping, or orienting.

324, Electricity: Measuring and Testing, see Lines With Other Classes and Within This Class, Measuring and

Testing, in the class definition of Class 343.

332, Modulators, subclass 174 for absorption type amplitude modulators which may include a directive antenna.

333, Wave Transmission Lines and Networks, subclasses 1+ for plural channel wave transmission systems which may be used for coupling antennas to their transmitters or receivers, which may involve impedance matching, directional couplers, hybrid type networks and switching in addition; subclass 22 for dissipating terminations for long lines which may simulate the power absorbing characteristics of antennas; subclass 23 for artificial lines which may simulate the impedance characteristics of an antenna over a frequency range; subclasses 24+ for coupling networks for coupling an antenna to its source or load, which may involve balanced to unbalanced coupling networks, delay networks, impedance matching, equalizers, and wave filters; subclasses 219+ for resonators of the distributed parameter type; and subclasses 236+ for long lines. See (11) Note immediately above. See also the reference to Class 333 in References to Other Classes in the class (343) definition.

336, Inductor Devices, appropriate subclasses, for inductor structure, per se, including coils and coil structure which may be used as loop antennas or in the coupling systems of antennas. See (12) Note, above.

340, Communications: Electrical, subclasses 853.1+ for telemetering via a radiant energy beam. See also (4) Note, C, 3 and (8) Note above, and Lines With Other Classes and Within This Class, Signaling, and Measuring and Testing, in the class definition for this class (343) and the reference to Class 340 in References to Other Classes in the class definition of Class 343.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 for reflected or otherwise returned radio wave energy systems which are characterized by some quality that varies according to the relative direction, position or plane of polarization of the sender and receiver, which may include and antenna. See Class 455 for transmitter and receiver, which may include and antenna. See Class 455 for transmitter and receiver systems where such directive properties are not present.

359, Optics: Systems (Including Communication) and Elements, subclasses 483+ for optical polarizers, subclasses 642+ for optical lenses, subclasses 838+ for optical reflectors and subclasses 350+ and 885+ for optical filters.

362, Illumination, for illuminating devices which often are structurally similar to antennas; particularly subclass 19 for illuminating means with a polarizer; subclass 327 for combined reflectors and refractors; subclasses 341+ for reflectors and subclasses 326+ for refractors.

375, Pulse or Digital Communications, for pulse communication apparatus having an antenna.

403, Joints and Connections, appropriate subclasses for a joint or coupling which may be used in an antenna. See especially subclasses 52+ for articulated connections.

426, Food or Edible Material: Processes, Compositions, and Products, subclasses 234, 235, 236, and 237+, for processes involving the application of electromagnetic waves in the treatment of foods.

439, Electrical Connectors, for electrical connector or terminal structure which may be used in antennas. See also (4) Note, C, 8, above.

455, Telecommunication, particularly subclasses 6, 19, 25, 82, 83, 107, 121+, 129, 131, 193, and 269+ for analog modulated carrier wave communication systems with antenna structure.

607, Surgery: Light, Thermal, and Electrical Application, subclasses 115+ for electrical applicators for treating the human body.

701 This subclass is indented under subclass 700. Subject matter wherein the antenna includes an electric discharge device, the space discharge of this device serving as a portion of the antenna or the antenna coupling.

(1) Note. When the combination of the antenna and discharge device performs some function in addition to the antenna function, and structure performing such additional function is classified elsewhere, classification is with such structure. For example, the combination of antenna and discharge device is Classified in Class 455, Telecommunications, subclasses 129 and 269+, if the tube operates as an oscillator or detector, the combination being a transmitter or receiver respectively, or in this class (343), subclasses 350+ if in addition the combination is directive.

(2) Note. For the space discharge to serve as the antenna coupling as defined above, the discharge must actually convey the signal energy. The mere control of the discharge by the signal device as in the conventional amplifier triode is not sufficient for classification here.

SEE OR SEARCH CLASS:

315, Electric Lamp and Discharge Devices: Systems, subclass 34 for the structural combination of an antenna integral with a space discharge device.

342, Communications: Directive Radio Wave System and Devices (e.g., Radar, Radio Navigation), subclasses 350+ for directive transmitting and receiving systems, which may include electric space discharge devices combined with antennas. See also (1) Note above.

455, Telecommunications, subclass 291 for means for coupling antennas to radio receivers by means of electron tube means.

702 This subclass is indented under subclass 700. Subject matter wherein the antenna is combined with the cabinet which encloses the receiving or transmitting structure in such manner that a significant relationship exists between the antenna and cabinet.

(1) Note. A significant relationship may exist between the antenna and the cabinet when the antenna and cabinet have a common portion, when the antenna retracts into the hollow cabinet, when the antenna is shaped to correspond to the cabinet shape, or when the antenna is contained within the cabinet. However, when the cabinet is a mere support for the antenna mounted externally thereon, classification is not in this subclass, but in subclasses 878+, below.

(2) Note. Antennas combined with a housing or protective covering for the antenna alone are not classified in this subclass but in subclass 872, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

872+, for antennas with a housing or protective covering. See (2) Note, above.

878+, for antennas with a support. See (1) Note, above.

SEE OR SEARCH CLASS:

312, Supports: Cabinet Structure, subclass 7.1 for radio type cabinets.

455, Telecommunications, subclasses 269+ for radio cabinets combined with antenna positioning or support means.

703 This subclass is indented under subclass 700. Subject matter wherein the antenna is combined with structure which tells the magnitude of the signal energy flowing to, in, or from the antenna, and wherein a significant relationship exists between the antenna and this measuring structure.

(1) Note. Patents within the general subclass definition involving testing are classified in this subclass, if the testing involves measuring as herein defined.

(2) Note. Antennas combined with a signal, indicator, or alarm which indicates some condition of the antenna are classified in subclasses 760 and 894 below. Also, patents within the general definition involving testing are classified in subclass 894 below, if the testing involves indicating as there specified without measuring.

(3) Note. See (1) and (2) Notes above for statements concerning testing.

(4) Note. A significant relationship may exist when the measuring structure and active antenna share a common detail, or when the measuring device is coupled to the antenna where the voltage or current is critical, such as a standing wave node or anti-node, or when details peculiar to an antenna are necessary for the operation of measuring structure. See also Lines With Other Classes and Within This Class, Measuring and Testing, under the class definition for this class (343).

SEE OR SEARCH CLASS:

324, Electricity: Measuring and Testing, particularly subclasses 76.11+ for measuring electrical energy generally.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 417+ for direction finding receivers which involve, in addition to the measuring structure responsive to the magnitude of the signal energy, structure for showing the location of a remote signal source.

455, Telecommunications, subclasses 67.1+ and 226.1 for means for testing and calibrating radio systems and/or receivers.

704 This subclass is indented under subclass 700. Subject matter wherein the antenna includes means which prevents or reduces ice, snow or sleet accumulation, such as heating apparatus or material having a low freezing point.

SEE OR SEARCH THIS CLASS, SUBCLASS:

904, for antennas combined with structure for perfecting the antenna not otherwise classified.

SEE OR SEARCH CLASS:

62, Refrigeration, subclasses 80, 140, 151, 234, and 272+ for refrigeration processes and apparatus involving defrosting, and subclasses 73 and 349+ for congealed product making with thawing.

138, Pipes and Tubular Conduits, subclasses 32+ for pipes and tubular conduits with thawing and freeze prevention.

165, Heat Exchange, subclasses 47+ for a structurally installed heat exchanger.

191, Electricity: Transmission to Vehicles, subclass 62 for structure transmitting electricity to vehicles with ice preventers or clearers.

219, Electric Heating, appropriate subclasses for electric heating means.

244, Aeronautics and Astronautics, subclass 134 for aircraft structure with ice prevention.

252, Compositions, subclass 70 for compositions including those for frost prevention and ice thawing.

336, Inductor Devices, subclasses 55+ for inductor devices with temperature modifying means.

340, Communications: Electrical, subclasses 387.1+ for audible electrical weatherproofing signaling means which may be combined with devicers.

705 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with, or has at least a part in common with at least a part of, a device peculiarity adapted to travel or be suspended in the air such as an airplane, balloon, projectile, or guided missile, and wherein a significant relationship exists between the device and the active antenna.

(1) Note. A significant relationship exists when the details of the active antenna cooperate with details of the aircraft

device, as when the antenna is shaped in accordance with the shape of the device.

(2) Note. Where the device with which the antenna is combined is a watercraft or vehicle, not peculiarly adapted or limited to travel or to be suspended in the air, classification is not here but in subclasses 709+ and 711+ below, as qualified by (3) Note.

(3) Note. Combinations of an antenna and aircraft when the aircraft is a mere support, and the antenna could be supported as well on some other object, are not classified in this subclass, but in subclasses 878+ below.

(4) Note. Combinations of specific aircraft structure and a nominal antenna are not classified in this subclass, but in Class 244, Aeronautics.

SEE OR SEARCH THIS CLASS, SUBCLASS:

709+, for antennas combined with watercraft.
711+, for antennas combined with a vehicle.
877, for antennas with a reel.
878+, for antennas with a support.

SEE OR SEARCH CLASS:

102, Ammunition and Explosives, particularly subclasses 335+ and 405, for aerial type mines and pyrotechnics which travel through the air, respectively.
244, Aeronautics and Astronautics, for aircraft structure in general. See also (1) Note, above.

706 This subclass is indented under subclass 705. Subject matter wherein at least a portion of the active antenna is maintained in an elevated position by a lighter-than-air device, e.g., balloon.

(1) Note. The antenna may be mounted on the device to move about freely therewith, or one end may be secured to the ground and the other end maintained by the device in an elevated position.

SEE OR SEARCH CLASS:

102, Ammunition and Explosives, subclasses 348 and 354 for pyrotechnics combined with balloons.
244, Aeronautics and Astronautics, subclasses 30 and 31+ for lighter-than-air airships and balloons, respectively.

707 This subclass is indented under subclass 705. Subject matter wherein the active antenna is an elongated flexible mass suspended from the aircraft, or the active antenna is suspended from the aircraft by an elongated flexible support so that the antenna will trail from the aircraft as by the relative motion between the aircraft and the surrounding air.

SEE OR SEARCH THIS CLASS, SUBCLASS:

709, for water-borne trailing antennas.
877, for antennas with reels.

SEE OR SEARCH CLASS:

114, Ships, subclass 311 for drags or sea anchors.
188, Brakes, subclasses 378+ for vibration dampers which use the inertia of a damping mass to dissipate motion; and subclass 381 for dampers using friction between damper elements to dissipate motion.
244, Aeronautics and Astronautics, subclass 1 for aircraft with trailing structure, which may be a nominal antenna.

708 This subclass is indented under subclass 705. Subject matter wherein the active antenna and the device have a common portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

710, for antennas with watercraft wherein the watercraft have a part in common with the active antenna.
712, for antennas with a vehicle wherein the vehicle or part thereof is a part of the active antenna.
720, for antennas with a diverse type art device wherein the device and antenna have a common portion.

709 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with, or has at least a part in common with at least a part of a device peculiarly adapted for travel or to be suspended in water, such as a surface ship, submarine, torpedo, buoy or other floating structure and wherein a significant relationship exists between the device and the active antenna.

(1) Note. A significant relationship exists when the details of the active antenna cooperate with details of the watercraft device, as when the antenna is shaped in accordance with the shape of the device.

(2) Note. Where the device with which the antenna is combined is a vehicle not peculiarly adapted or limited to travel or be suspended in the water, classification is not here but in subclasses 711+ below, as qualified by (3) Note immediately following.

(3) Note. Combinations of an antenna and watercraft when the watercraft is a mere support, and the antenna could be supported as well on some other object, are not classified in this subclass, but in subclasses 878+ below.

(4) Note. Water buoyant antennas are classified here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

705+, for antennas combined with an aircraft.
707, for aircraft with a trailing or drag type antenna.
711+, for antennas combined with a vehicle.
719, for antennas buried underground or submerged under water.
878+, for antennas with a support.

SEE OR SEARCH CLASS:

114, Ships, for ships and watercraft in general, and particularly subclass 311 for drags and sea anchors.
441, Buoys, Rafts, and Aquatic Devices, subclasses 1+ for buoys.

710 This subclass is indented under subclass 709. Subject matter wherein the active antenna and the device have a common portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:

708, for antennas with aircraft, wherein the aircraft is part of the active antenna.
712, for antennas with a vehicle wherein the vehicle is a part of the active antenna.
720, for antennas with diverse type art devices which may have a common portion.

711 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with, or has at least a part in common with at least a part of, vehicle structure or accessories peculiarly adapted for use with a vehicle, and wherein a significant relationship exists between the antenna and vehicle or accessory structure.

(1) Note. A significant relationship exists when the details of the active antenna cooperate with details of the vehicle, as when the antenna is shaped in accordance with the vehicle shape.

(2) Note. Where the combined vehicle structure is part of a ship, submarine, aircraft or any similar vehicle having structure limiting it to use in air or water, classification is not here. See the search notes below.

(3) Note. Combinations of an antenna and vehicle when the vehicle is merely a support for the antenna, and the antenna could be supported as well on some other object, are not classified here. See the search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

705+, for antennas combined with vehicles or devices which travel or are suspended in air. See (2) Note, above.
709+, for antennas combined with watercraft. See (2) Note, above.
878+, for antennas with supports. See (3) Note, above.

SEE OR SEARCH CLASS:

246, Railway Switches and Signals, particularly subclasses 8 and 30 for railway signaling devices and systems.

280, Land Vehicles, for vehicles and related subject matter. See also the general notes therein.

712 This subclass is indented under subclass 711. Subject matter wherein the active antenna and vehicle structure or accessory have a common portion.

(1) Note. The active antenna or portion thereof may constitute an element of the vehicle, or conversely the vehicle or portion thereof may constitute an element of the active antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

708, and 710, for antennas having a portion in common with a device traveling or suspended in air or water, respectively.

720+, for antennas combined with a diverse type art device.

729+, for plural diverse type antennas using the same active element.

846+, for grounding structure having a portion in common with a vehicle.

SEE OR SEARCH CLASS:

293, Vehicle Fenders, particularly subclass 136 for vehicle bumpers with mounting means which may be of rubber or other insulating material, wherein the bumper may be used as an antenna.

713 This subclass is indented under subclass 711. Subject matter wherein the body of the vehicle serves as a support or supporting base for the antenna.

(1) Note. For classification in this subclass the antenna must be combined with the vehicle shell or body, which in the case of an automobile is mounted on the running gear (chassis). The body includes the top, hood, fenders, doors, windshield, cowl, etc., as opposed to accessories such as bumper, spare tire, mirror, turn indicator, etc., which latter group when combined with an antenna, may be classified in subclass 711, above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

718, for antennas which are adapted to be attached to or carried by the human body.

720+, for antennas combined with a diverse type art device.

878+, for antennas with supports.

SEE OR SEARCH CLASS:

105, Railway Rolling Stock, appropriate subclasses, for railway rolling stock body structure.

180, Motor Vehicles, subclasses 89+ for motor vehicle bodies.

293, Vehicle Fenders, subclass 136 for vehicle fenders with rubber mounting means or the like.

296, Land Vehicles: Bodies and Tops, for land vehicles bodies and tops.

714 This subclass is indented under subclass 713. Subject matter wherein the active antenna or a portion thereof is movably supported on the vehicle body together with structure controlled within the body for moving the antenna for such purposes as adjusting the operative position of the antenna or moving the antenna from an operative to an inoperative position, e.g., extending or retracting a rod antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

723, for single linear antennas adjustable in length which have an appreciable wave length dimension.

757+, for antennas combined with means for moving such antennas for scanning, sweeping or orienting.

823, for centered balanced doublet antennas adjustable in length.

869, for loop antennas with a rotatable support.

877, for antennas with a reel for winding such antennas. See also the search notes thereunder.

880+, and 889, for antennas with an adjustable or collapsible support, and for rod type antennas retractable into a support, respectively.

901+, for telescoping rod type antennas.

715 This subclass is indented under subclass 713. Subject matter wherein the active antenna is of the rod type as defined in subclass 900, below.

(1) Note. See (1) Note under subclass 900 below for the lines between rod type antennas and rod structure as found in classes such as 52, Static Structures (e.g., Building), and 174, Electricity: Conductors and Insulators.

SEE OR SEARCH THIS CLASS, SUBCLASS:

714, for a combined vehicle and rod type antenna whose position is changed or which may be extended or retracted by control means situated inside the vehicle.

900, and the search notes thereunder, for rod type antennas in general.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclasses 720+ for a residual rigid elongated unit not defining an electrical feature for Class 343.

716 This subclass is indented under subclass 713. Subject matter wherein the portion of the body supporting the antenna is the running board.

717 This subclass is indented under subclass 711. Subject matter wherein the antenna, when in operative position, is supported under the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

713+, for antennas supported by the body of a vehicle, as distinguished from the subject matter in this subclass (717), where the antennas are supported from other parts of the vehicle than the body, generally the chassis. See (1) Note under subclass 713, above.

716, for antennas supported under the running board of a vehicle.

878+, for antennas with a support.

718 This subclass is indented under subclass 700. Subject matter wherein the antenna is shaped to fit the body or to be supported by body, or including structure whereby the antenna is secured to the body to be freely portable by the body under operative conditions, or structure which enables the body to operate as an antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

878, for antennas with a support.

906, for antennas with an electrical connector.

908, for antenna elements of a particular shape.

SEE OR SEARCH CLASS:

224, Package and Article Carriers, subclasses 5+ for body or belt attached package and article carriers.

455, Telecommunications, subclass 351 for portable radio receivers.

607, Surgery: Light, Thermal, and Electrical Application, subclasses 149+ for body attaching electrodes.

719 This subclass is indented under subclass 700. Subject matter wherein the active portion of the antenna is claimed to be at least partially buried under the ground or submerged in water under operative conditions.

(1) Note. For classification in this subclass, the active antenna must be at least partially buried under the ground or submerged in water generally. Antennas having a liquid-filled housing and liquid column antennas placed above ground are not classified her, but in subclasses 700 and 872+ respectively.

SEE OR SEARCH THIS CLASS, SUBCLASS:

709+, for water-borne antennas.

829+, for fractional, multiple, or full wave linear type antennas with grounding structure.

841+, for antennas with electrical shields which may be used underground or under water.

845, for antennas with a ground connection spaced from the feed line connection.

846+, for antennas with grounding structure, including counterpoises.

872+, for antennas with a housing or protective covering which may be used underground or underwater.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 6+ for earth grounds for electrical apparatus generally, and subclasses 37+ for underground conductors.

720 This subclass is indented under subclass 700. Subject matter wherein the antenna is combined with other devices or structures having an added purpose or independent utility other than to perfect the antenna, i.e., the other devices or structures are not directly related to the primary function of the antenna, which is the emission or collection of electromagnetic wave energy together with the conveying of such energy to or from the transmitter or receiver leadin.

(1) Note. This subclass receives subject matter such as an antenna combined with a lamp, building structure, umbrella, etc., if more than a mere support. Antenna perfections or improvements are classified elsewhere in the antenna subclasses, subclasses 904+ being the residual home for such perfections or improvements.

(2) Note. Combinations of antennas and other devices or structures wherein such other devices or structures are claimed in broad terms merely for such purposes as background for the antenna or supporting the antenna are not classified here, but in the appropriate antenna perfecting subclass. For example, classification is in subclasses 878+ if the other device is a support.

(3) Note. Generally where the antenna, within the subclass definition, itself is designed to function also as another device, as for example, a venetian blind or water sprinkler, classification is in this subclass.

(4) Note. Generally where antenna details are claimed together with other device or structure broadly or specifically, classification is here, especially where the other device is mechanical in nature as opposed to electrical. When such device or structure is an element or component radio apparatus, classification may be in the appropriate subclass in Class 455. For example, subject matter involving an antenna and a loud speaker or an antenna and a power supply for a radio apparatus would be classified in Class 455.

(5) Note. Generally where the antenna is claimed broadly and the other device or structure is claimed specifically, classification is with such other device or structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
705+, for antennas combined with a device traveling or suspended in the air.
709, for water-borne antennas.
711+, for antennas combined with vehicle structure.
904+, for antennas combined with perfecting structure, not classified elsewhere. See also (1) Note, above.

SEE OR SEARCH CLASS:
315, Electric Lamp and Discharge Devices: Systems, subclass 34 for electric lamp and discharge devices and systems combined with antennas.
455, Telecommunications, subclasses 344+ for radio receivers combined with diverse type art device.

721 This subclass is indented under subclass 720. Subject matter wherein the diverse type art device is a light.

(1) Note. Where the light is a signal or indicator to provide an indication of the condition of the antenna such as direction, classification is in subclass 760 or 894, below.

(2) Note. Antenna subject matter together with structure energizing a light is classified herein even though the light itself is not claimed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

760, for antennas with means for moving the antenna for sweeping, scanning or orienting including signals, indicators or alarms. See also (1) Note, above.

894, for antennas in general with a signal, indicator or alarm. See also (1) Note, above.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclass 28 for obstruction lights to warn aircraft, and subclasses 907+ and 468+ for traffic and vehicle signal light systems and signal lights, respectively.

362, Illumination, appropriate subclasses for illuminating devices.

722 This subclass is indented under subclass 700. Subject matter wherein an active antenna includes an elongated portion having lumped inductance and capacity in series or shunt with the active portion remote from the lead-in terminals to pass a particular frequency or band of frequencies and to block another frequency or band of frequencies.

(1) Note. In this subclass the lumped inductance and capacity usually act as an impedance in effect terminating the active antenna at its point of connection for a particular frequency, or they may cause the active antenna to resonate at a plurality of different frequencies.

(2) Note. For Classification in this subclass, the inductance and capacity must be lumped. Antennas having distributed inductance and capacity in series or shunt with the active portion remote from the lead-in connection to pass a particular frequency or band of frequencies and to block another frequency or band of frequencies are not classified in this subclass, but in subclasses 802 and 828 below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

723, for single adjustable length electrically long linear antennas.

729+, for plural diverse type antennas using the same active element.

744, for high frequency loop type antennas with series reactance in the loop.

745+, for antennas with variable reactance for tuning the antenna.

749+, for antennas with lumped reactance for loading the antenna.

802, for balanced doublet antennas with distributed reactance added to the arms.

828, for fractional, multiple or full wave length linear type antennas with a non-uniformity in the antenna.

850+, for antennas in general with a coupling network or impedance in the leadin which may include filters in the coupling network.

SEE OR SEARCH CLASS:

333, Wave Transmission lines and Networks, subclasses 167+ for wave filters, per se.

723 This subclass is indented under subclass 700. Subject matter wherein the antenna is a single end fed elongated linear mass of appreciable electrical length, and is physically adjustable in its length, usually for tuning the antenna.

(1) Note. A lattice type tower may be classified here, if it is the electrical equivalent of a single end fed elongated linear mass, and the other limitations of the definition are met.

(2) Note. For classification herein the resonant length of the linear antenna or some indication of appreciable electrical length together with adjustability must be claimed, as for example “adjustable in length for tuning” (see subclasses 825+ where a particular wave length is claimed but the adjustable feature is not claimed). Subject matter involving adjustable length linear antennas which are not of appreciable wave length, is not classified herein. For example, adjustable length rod type antennas are classified in subclasses 900+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

745+, for antennas with a variable reactance separate and distinct from the antenna for tuning.

750, for antennas for appreciable electrical length with adjustable reactance for loading.

823, for balance doublet antennas with adjustable length.

825+, for fractional, multiple or full wave length linear type antennas.

874+, for mast or tower type antennas.

900+, for rod type antennas which may be adjustable in length.

724 This subclass is indented under subclass 700. Subject matter wherein the active antenna is constructed so that it may be changed into a different species of active antenna as, for example, by switching means connecting the active portion or portions in a different arrangement to the source or load or by adding to or removing part of the radiating or collecting element.

(1) Note. For classification in this subclass the converting structure must produce a different active antenna having significantly different physical or electrical characteristics as opposed, for example, to adding sections to or adjusting the antenna to change its physical or electrical length, or adding or removing auxiliary structure (e.g., reflector).

(2) Note. In this subject matter the different antennas are not in physical existence at the same time, but exist alternately, as opposed to the subject matter of subclasses 729+ wherein plural diverse antenna exist simultaneously. Yet here, as in subclasses 729+, the different antennas employ a common active portion.

(3) Note. For classification here, the change may be from one type of active antenna to another such as from a center-fed balanced doublet to a capacity type antenna or from a loop to a trailing wire antenna; or the change may be from one species of antenna to another within a type, such as from a folded dipole to a simple rod dipole.

(4) Note. The rules recited under subclass 725 for determining when antennas are of different type are not applicable here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

725+, for plural separate diverse type antennas. See (4) Note, above.

729+, for plural diverse type active antennas using the same active element. See also (2) Note, above.

794, for diverse type balanced center-fed doublet antennas.

832, for an active antenna which is also a reflector.

850+, for active antennas with a coupling network or impedance in the leadin, and particularly subclass 859 for balanced to unbalanced coupling.

876, for antennas with switching means between the antennas and lines.

904, for antennas with a switch.

725 This subclass is indented under subclass 700. Subject matter including two antennas each of different type, whose active radio wave radiating or collecting elements are physically separate and distinct.

(1) Note. When the antennas are, per se, classifiable in different coordinate subclasses directly indented under subclass 700, which provide for different types of antennas such as subclasses 767, 772, and 793, the antennas are deemed “of different type” as used in the above definition. If the antennas are, per se, classifiable in different indented subclasses of one of these coordinate subclasses as here established, they are not classified in this subclass (725), but in the coordinate subclass or the appropriate indented subclass thereunder. For example, a plurality of diverse type doublets would be classified in subclass 794, and a plurality of diverse wave guide type antennas, neither being of the bi-conical horn type, would be classified in subclasses 776+. Antennas falling in different coordinate subclasses directly indented under subclass 700 which subclasses are directed

to combinations, are not necessarily of different types. The different types of antennas as the term is here used are established by distinctions in the active portions of the antennas, as opposed to distinctions arising from combining the active antennas with auxiliary structure, such as reflectors, coupling networks, and supports.

(2) Note. The term "physically separate and distinct" requires that the radiating or collecting elements of each antenna be a complete entity, and not share in whole or in part a common radiating or collecting portion. Such subject matter where the collecting or radiating portions are so shared are classified in subclasses 729+, below. However, the sharing of a common support or coupling, or the utilization by one antenna as a coupling element or support for the radiating or collecting element of the other antennas does not preclude classification in this subclasses (725+).

(3) Note. For classification in this subclass, there must be a plurality of antennas. A single antenna composed of structurally different active parts is not here classified. For example, a sleeve type antenna with a rod coaxial with the sleeve the rod and sleeve being connected to opposite terminals of the same line, does not constitute a plurality of antennas, and is classified in subclass 791, below. If each of a plurality of active elements is able to function independently without any of the remaining elements, a plurality of antennas by be present. Separate terminals or lead-in lines particularly with the transmission of a plurality of signals, is also indicative of a plurality of antennas. It may be noted that the utilization of one antenna by another as its feed does not preclude the antennas being considered plural.

SEE OR SEARCH THIS CLASS, SUBCLASS:

720, for an antenna combined with a diverse type art device.

724, for an antenna convertible to an antenna of a different type.

729+, for plural diverse type active antennas having a common radiating or collecting portion. See (2) Note, above.

758, for plural antennas relatively movable for scanning, sweeping or orienting.

770+, for plural slot type antennas.

776+, for plural wave guide type antennas.

794, for diverse type balanced doublet antennas.

796, 797+, 799+, and 810+, for plural balanced doublets.

824, for a planar array of linear antennas.

826+, for plural, fractional, multiple or full wave linear type antennas.

835, for plural active antennas with a reflector.

844, for plural antennas spaced a fractional or full wave length apart.

852, for plural antennas with impedance matching.

853, for plural antennas with a coupling network or impedance in the leadin.

867, for plural loop type antennas.

879, for plural separate antennas with supports.

893, and the Search Notes thereunder for plural antennas in general.

904+, for antennas combined with other perfecting structure not elsewhere provided for.

726 This subclass is indented under subclass 725. Subject matter wherein one of the diverse type antennas is of the loop type and one other of the diverse type antennas is of the center-fed balanced doublet type, as defined in subclasses 741, 793, and 866, below.

(1) Note. For the field of search relating to this subject matter see the search notes under subclasses 727 and 728 immediately below.

727 This subclass is indented under subclass 725. Subject matter wherein one of the diverse type antennas is of the center-fed balanced doublet type as defined in subclass 793, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

793+, for center-fed balanced doublet type antennas in general, and arrays of such doublet antennas.

728 This subclass is indented under subclass 725. Subject matter wherein one of the diverse type antennas is of the loop type as defined in subclasses 741 and 866 below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

732, for circular loop type traveling wave antennas.

741+, for high frequency loop type antennas.

764, for loop type antennas with means for scanning, sweeping or orienting.

788, for loop type antennas including magnetic material.

842, for loop type antennas with electrical shielding.

855, for plural loop type antennas with coupling.

866+, for loop type antennas in general.

SEE OR SEARCH CLASS:

336, Inductor Devices, for inductor devices.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 350+ and particularly subclasses 417+ for directive resistant energy communication systems which may include diverse type antenna one of which may be a loop type antenna.

729 This subclass is indented under subclass 700. Subject matter including two antennas each of different type, whose active radio wave radiating or collecting elements are at least partly in common.

(1) Note. For a construction of the term "of different type" see (1) Note under subclass 725 above.

(2) Note. The term "active radio wave radiating or collecting elements" does not include reflector structure, coupling structure, or support structure. When such structures are involved, classification is in subclasses 725+ above, if the antennas are of different type.

(3) Note. For classification in this subclass, there must be a plurality of antennas. A single antenna composed of structurally different active parts is not here classified. For example, a sleeve type antenna with a rod coaxial with the sleeve, the rod and sleeve being connected to opposite terminals of the same line, does not constitute a plurality of antennas, and is classified in subclass 791, below. If each of a plurality of active elements with the common portion is able to function independently in its usual manner without the other a plurality of antennas may be present. Separate terminals or lead-in lines particularly with the transmission of a plurality of signals, is also indicative of a plurality of antennas. It may be noted that the utilization of one antenna by another as its feed does not preclude classification here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

725+, and the search notes thereunder, for plural separate diverse type antennas and for subject matter pertinent to plural diverse type antennas, respectively.

791, for a single antenna composed of a sleeve and a rod. See also (3) Note, above.

730 This subclass is indented under subclass 729. Subject matter wherein one of the antennas is of the balanced doublet type as classified in subclass 793, below.

(1) Note. Usually the patents in this subclass involve a dipole with a balanced coupling to a source or load together with an unbalanced coupling which connects this same dipole structure as a T antenna or a rod type antenna to the same or different source or load.

SEE OR SEARCH THIS CLASS, SUBCLASS:

794, for plural diverse type balanced doublets. See (1) Note under subclass 729.

816, for plural balanced doublets with coupling.

853, for plural antennas with coupling networks.

859, for antennas with balanced to unbalanced coupling.
865, for balanced antennas with a balanced coupling network.

731 This subclass is indented under subclass 700. Subject matter wherein an elongated conducting mass of appreciable electrical length with respect to the wave length of the signal energy (usually greater than a half-wave length) is coupled to free space continuously along its length to transmit signal energy between the mass and free space along its length; the mass being inherently adapted to, or being arranged to, or including structure to give the mass a delay or acceleration characteristic in the direction of propagation of the radio wave in space to which the mass is coupled so that the wave of electric energy conducted along the mass remains in phase with the associated radio wave moving in space.

(1) Note. In receiving, the interaction between the wave propagated along the elongated conductive mass and the wave in space coupled to the mass results in a traveling wave progressively increasing in magnitude along the length of the path of the propagated wave, due to the reinforcing of the in-phase space wave collected along the antenna as the collected wave travels towards the receiving means. The mere conduction of wave energy along its length as in a wave guide type antenna of subclass 772 is not sufficient for classification here. The wave energy must progress in phase with the space wave to secure the reinforcing of the wave energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:
739, for antennas having resistance electrically remote from the coupling to a source or load for such purposes as the prevention of reflected waves.
811, for fishbone type arrays of center-fed balanced doublet type antennas.
845, for antennas with a ground connection spaced from the feed line connection.

732 This subclass is indented under subclass 731. Subject matter wherein the elongated conducting mass forms substantially a circle in a single plane.

(1) Note. Helical traveling wave type antennas are not classified in this subclass since any single loop turn does not lie in a single plane, but are classified in subclass 731 above. A plurality of traveling wave type antennas whose respective active portions are arranged end to end to form a circle are not classified herein but in subclass 737, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
741+, for high frequency type loops which do not operate on the traveling wave principle.
866+, for loop type antennas in general which do not operate on the traveling wave principle.

733 This subclass is indented under subclass 731. Subject matter wherein the elongated conducting mass is formed in two co-extensive portions, each portion being connected at the corresponding end to a lead-in terminal, the portions diverging and then converging to form a diamond or rhombus.

SEE OR SEARCH THIS CLASS, SUBCLASS:
734, for rhombic type traveling wave antennas with feedback.
735, for balanced V type traveling wave antennas having the configuration of part of a rhombic wave antenna.
736, for inverted V type traveling wave antennas having the configuration of part of a rhombic wave antenna.
741, for high frequency type loops.
806, for zigzag type balanced doublets.
866, for loop type antennas in general.

734 This subclass is indented under subclass 733. Subject matter including a circuit extending from the end of the conducting mass opposite the lead-in terminals around the mass to the antenna leadin or to associated circuitry for conveying, for example, the nonradicated energy back to the antenna input.

735 This subclass is indented under subclass 731. Subject matter wherein the conducting mass is composed of two diverging portions, each portion connected at the apex to a transmitter or receiver in a balanced manner.

(1) Note. The subject matter of this subclass resembles in structure doublets with the arms nonlinearly arranged as classified in subclass 809, below. However, in this subclass (735) the standing waves are suppressed, as opposed to the utilization of such waves in subclass 809, below.

(2) Note. In this subclass the antenna is fed in a balanced manner at the apex of the V, while in subclass 736 the antenna is fed in an unbalanced manner at the free end of the V.

SEE OR SEARCH THIS CLASS, SUBCLASS:

733, for rhombic type wave antennas which may include a V type wave antenna as a part thereof.

736, for inverted V type traveling wave antennas. See also (2) Note, above.

805, 808 and 809, for center-fed balanced doublets involving a V configuration. See also (1) Note, above.

736 This subclass is indented under subclass 731. Subject matter wherein the conducting mass is formed as a V, and lying usually in a substantially vertical plane with the apex of the V uppermost, and one end of the mass being connected to an unbalanced lead-in terminal.

(1) Note. In this subclass the antenna is fed in unbalanced manner at the free end of the V, while in subclass 735 above the antenna is fed in a balanced manner at the apex of the V.

(2) Note. The antennas of this subclass may include a tilt-type antenna as an element thereof. Such tilt-type antennas are classified in subclass 731 above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

733, for rhombic traveling wave type antennas.

735, for balanced V traveling wave type antennas. See (1) Note, above.

806, for zigzag type balanced doublet antennas.

824, for planar arrays of linear antennas. 826, for plural fractional, multiple or full wave linear type antennas. 859, for antennas with balanced to unbalanced coupling networks in the leadin.

737 This subclass is indented under subclass 731. At least two antennas, each above, which are independently operable.

(1) Note. Two wires with a reflection transformer at the end remote from the coupling are not deemed plural within the definition, since each wire requires the cooperation of the other for the antenna to operate in its intended manner. Such subject matter is classified in subclass 738 below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

844, for plural antennas spaced a fractional or full wave length apart.

853+, for plural antennas in general with a coupling network or impedance in the leadin.

893, for plural antennas in general. See also the search notes thereunder for a field of search for plural antennas generally.

738 This subclass is indented under subclass 731. Subject matter wherein the conducting mass is composed of two adjacent coextensive wires with a termination at the end opposite the coupling end, a signal wave which is picked up by the wires and which is conducted along the wires to the termination being returned over the wires in phase opposition in the respective wires, i.e., the wires are effective as a balanced line for this returned energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:

737, for plural traveling wave type antennas in general which may include one or more two-wire antennas with reflection transformers of the type defined above.

739 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with a resistance at the end electrically remote from the lead-in terminal to the transmitter or receiver, the resistance being connected to form a closed electric loop across the transmitter or receiver.

(1) Note. In this subclass the essential purpose is usually to render the antenna a periodic. The resistance in this subclass (739) is usually equal to the characteristic impedance of the active antenna. The antennas of this subclass may involve traveling waves, but these waves are usually combined only to be effective as standing waves. The antennas in this subclass are generally of the "broadside" type (i.e., the resulting radiation pattern lies in a generally perpendicular axis to that of the active antenna element) whereas the traveling wave type antennas of subclass 731 are generally of the "end-fire" type, i.e., the radiation pattern established by the active antenna element lies along the same axis as the active antenna element.

(2) Note. The loop may be formed through ground.

SEE OR SEARCH THIS CLASS, SUBCLASS:

731+, for traveling wave type antennas terminated at the end remote from the antenna leadin in a resistance. See also (1) Note, above.

845, for antennas with a ground connection spaced from feedline connection.

740 This subclass is indented under subclass 739. Subject matter wherein the active antenna includes the return circuit as an active portion thereof, thus forming two similar active portions, which are connected respectively to balanced lead-in terminals.

SEE OR SEARCH THIS CLASS, SUBCLASS:

733, for rhombic type traveling wave antennas.

735, for balanced V type traveling wave antennas.

741, for high frequency type loops.

792, for sleeve type antennas arranged as doublets.

793+, for balanced doublets, and particularly subclass 803 for folded dipoles.

842, for loop type antennas with shields.

850+, and particularly subclasses 859 and 865, for coupling networks involving balanced circuits.

866, for loop type antennas in general.

741 This subclass is indented under subclass 700. Subject matter wherein a current path of appreciable electrical length is arranged as a substantially closed active loop having an appreciable electrical dimension between all opposing points on the loop together with structure or proportions to maintain a desired current distribution around the loop.

(1) Note. The desired current distribution usually involves a particular position of the standing wave pattern along the current path, or the instantaneous current effectively flowing in one direction along the current path. The purpose of this is usually to maintain an omnidirectional pattern in one plane.

SEE OR SEARCH THIS CLASS, SUBCLASS:

726, and 728, for plural separate diverse type antennas including a loop type antenna.

732, and 733+, for circular loop and rhombic traveling wave antennas respectively.

748, for loop type antennas with variable reactance for tuning.

764, for loop type antennas with means for moving the loop for scanning, sweeping or orienting.

788, for loop type antennas including magnetic material.

842, for loop type antennas with electrical shields.

855, for plural loop type antennas with a coupling network or impedance in the leadin.

866+, for loop type antennas in general.

742 This subclass is indented under subclass 741. Subject matter including two or more loops, each as defined in subclass 741 above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

800, for plural groups of circumferentially arranged doublets.

855, for plural loop type antennas with a coupling network or impedance in the leadin.

867, for plural loops in general.

743 This subclass is indented under subclass 741. Subject matter wherein the antenna feed line is connected at two or more spaced points along the perimeter of the closed loop.

SEE OR SEARCH THIS CLASS, SUBCLASS:

732, for traveling wave type antennas of circular loop configuration which may be coupled at spaced points.

799, for plural center-fed balanced doublet type antennas circumferentially arranged.

857, for antennas with the coupling at spaced points.

744 This subclass is indented under subclass 741. Subject matter wherein the closed loop includes inductance or capacity in series around the current path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

722, for antennas with lumped reactance filters therein.

732, for traveling wave type antennas arranged in a circular loop which may have inductance or capacity in the active antenna.

743, wherein the series inductance or capacity is included in the current path, and the feed coupling is at spaced points on the loop.

748, for loop type antennas with variable reactance for tuning the antenna.

749+, for antennas with lumped reactance for loading.

788, for loop type antennas including magnetic material.

842, for loop type antennas with electrical shields.

745 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with an adjustable inductance or capacity, distinct and separate from the active antenna, the inductance or capacity providing a reactance which combines with the inherent reactance of the active antenna to establish a resonance in a circuit including the antenna, this resonance being at a frequency other than the natural electrical resonant frequency of the antenna, adjustment of the inductance or capacity changing this resonance.

(1) Note. The inherent reactance includes not only the distributed reactance of the active antenna but also the natural reactance of the antenna due to its location and surroundings, as for example, the capacity relation inherent in the position of the active antenna relative to ground.

(2) Note. Loading under subclass 749 is always combined with an active antenna of an appreciable electrical length, while such an appreciable length is not necessary for classification in this subclass (745). The reactance combined with the active antenna under loading (subclass 749) must be located within the active antenna, at its free end, or immediately contiguous the end of the active antenna closest to the leadin, whereas the adjustable reactance under this subclass (745) is located outside or external to the active antenna.

(3) Note. Adjustable reactance networks which do not tune the inherent reactance of the antenna are not classified here, but will be found in subclasses 850+, especially subclass 861 where adjustable impedance matching networks are involved.

(4) Note. Antennas combined with tuning networks are classified herein, except where in addition significant transmitter or receiver structure is claimed. For classification of such latter combinations, see Class 455, appropriate subclasses.

(5) Note. Where an adjustable reactance is combined with an active antenna but the combination is for changing the width of the resonant band, classification is not herein but in subclasses 850+ below. For classification herein adjustment of the reactance in such combinations must be for tuning, that is, changing the resonant frequency of the active antenna circuit.

(6) Note. The variable reactance may be located at the coupling end of the antenna, or at the end remote from the coupling end to connect the antenna to ground. In the latter case, if the reactance is not adjustable, classification is in subclass 845. See also subclass 750 below for antennas having adjustable reactance intermediate its ends for loading.

SEE OR SEARCH THIS CLASS, SUBCLASS:

722, for antenna having lumped reactance electrical filters between sections of the active antenna.

723, for single electrically long end-fed antennas which are adjustable in length for tuning.

731+, for traveling wave type antennas which may have phasing reactances within the active antenna.

739+, for active antennas having a terminating resistance at the open end.

744, for high frequency type loops having series reactance in the loop.

749+, for antennas having lumped reactance for loading. See also (2) Note above.

850+, for antennas in general with a coupling network or impedance in the leadin which may include adjustable reactances, and particularly subclass 861 for such antennas having an adjustable impedance matching network. See also (3) Note, above.

913, for reflectors or directors combined with an impedance which may have an adjustable reactance for tuning the reflector or director.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, particularly subclasses 167+ for wave filters, and subclasses 219+ for resonators of the distributed parameter type.

334, Tuners, appropriate subclasses for tuned networks for use in radiant energy apparatus and comprising inductance and capacitance elements in circuit arrangement to form a resonant circuit and in which structure is provided for adjusting one or both of these elements for changing the mean resonant frequency of the circuit.

336, Inductor Devices, particularly subclasses 130+ and 137+ for variable inductor devices which may be used in adjustable reactance circuits for tuning active antennas.

361, Electricity: Electrical Systems and Devices, subclasses 287+ for variable capacitors which may be used in tuning circuits.

455, Telecommunications, subclasses 150.1+ for receivers which may involve tuning.

746 This subclass is indented under subclass 745. Subject matter wherein the active antenna is of the slot type as defined in subclass 767 below.

(1) Note. For classification in this subclass the slot type antennas must have an adjustable reactance separate and distinct from the slot itself. Slot type antennas having a slidable short-circuiting bar across the slot remote from the feed line connection, for example, which defines the length of the slot and whereby the length of the slot may be adjusted for tuning are not classified in this subclass, but in subclasses 767+, below.

747 This subclass is indented under subclass 745. Subject matter wherein the active antenna is of the center-fed balanced doublet type as defined in subclass 793 below.

(1) Note. For classification in this subclass the variable reactance for tuning must be separate and distinct from the balanced doublet antenna. For example, balanced

doublet antennas having an adjustable length whereby the inherent reactance of the antennas may be varied for tuning are classified in subclass 823, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

814, 816 and 820+, for balanced doublet type antennas with coupling networks which may include adjustable reactance elements.

823, for balanced doublet type antennas whose length is for tuning. See also (1) Note, above.

748 This subclass is indented under subclass 745. Subject matter wherein the active antenna is of the loop type as defined in subclass 866, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

732, for traveling wave type circular loop antennas which may have phasing reactance within the loop.

744, for high frequency type loop antennas having series reactance within the loop.

855, for plural loop antennas with a coupling network or impedance in the leadin which may include variable reactance.

866+, for loop type antennas in general.

749 This subclass is indented under subclass 700. Subject matter wherein a resonant active antenna includes an elongated portion of appreciable electrical length having lumped inductance or capacity directly in series or shunt with the elongated portion (to modify the standing wave pattern existing along the portion, or to change the effective electrical length of the portion).

(1) Note. The lumped inductance or capacity must be intermediate the ends, at a free end or immediately at the leadin end of the active antenna for classification herein. Combinations of an active antenna with such inductances or capacitances located in a position remote or separate from the antenna are classified below in subclasses 850+, or where adjustable for tuning the antenna in subclasses 745+, above. In the special case where an adjustable lumped inductance or capacity is located immediately at the leadin end of the active antenna and tunes as well as loads the antenna, classification is in subclass 745 and the subject matter is cross-referenced herein.

(2) Note. For classification herein the inductance or capacitance must be of the lumped type. Where there is included a nonuniformity or other distributed parameter inductance or capacitance, such as a capacity hat classification is not herein, but in subclass 802 for center-fed balance doublets with distributed reactance added to the arms, or in subclass 828 for fractional multiple or full wave type antennas with a nonuniformity for reactive effect, or in subclass 899 for antennas with area increasing means generally.

SEE OR SEARCH THIS CLASS, SUBCLASS:

722, for antennas having a lumped reactance electrical filter located between active sections thereof.

723, for single electrically long linear type antennas adjustable in length for tuning.

731+, and 739+, for traveling wave type antennas and antennas combined with terminating resistances at the remote ends thereof respectively, which may have lumped inductances or capacitances in the active portions thereof.

741+, for high frequency loop type antennas which may have lumped inductance or capacitance in the active portions thereof.

745+, for antennas with variable reactance for tuning.

802, for center-fed balanced doublet antennas with distributed reactance added to the arms thereof. See also (2) Note, above.

806, for center-fed balanced doublet type antennas with bent arms which may modify the inherent inductance or capacitance otherwise present with consequent loading.

807, for center-fed balanced doublet antennas with tapered, thick or enlarged

arms which modify the inherent capacities of the antennas.

823, for center-fed balanced doublet type antennas whose length is adjustable.

828, for fractional, multiple, or full wave linear type antennas with a nonuniformity for reactive effect such as a capacity top. See also (2) Note, above.

850+, for antennas with coupling in general. See also the search notes thereunder for special types of antennas with coupling.

899, for antennas having area increasing means, such as spiniferous or with a metal ball on top of the antennas. See also (2) Note, above.

SEE OR SEARCH CLASS:

178, Telegraphy, subclasses 45+ for loaded transmission lines.

750 This subclass is indented under subclass 749. Subject matter wherein the lumped inductance or capacity is adjustable.

SEE OR SEARCH THIS CLASS, SUBCLASS:

745+, for antennas with variable reactance for tuning the antennas.

751 This subclass is indented under subclass 749. Subject matter including at least two antennas as defined therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

893, and the search notes thereunder for plural antennas in general.

752 This subclass is indented under subclass 749. Subject matter wherein the lumped inductance or capacity is connected at the free end of the active antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

802, for center-fed balanced doublets with distributed reactance added to the arms and which may be at the free ends.

828, for fractional, multiple or full wave linear type antennas with a nonuniformity therein, which may be at the free end of the antenna.

899, for antennas with area increasing means generally which may be at the free end.

753 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with structure spaced from or external to the active antenna which transmits waves going to or from the active antenna, and is shaped or positioned to delay or accelerate transmitted waves an amount which varies over the wave front, to alter the direction or propagation of the waves emitted from the structure with respect to the waves impinging on the structure, or to bring the wave to a focus, or to alter the wave front (such as to convert a spherical wave front to a planar wave front or vice versa).

(1) Note. The structure referred to above may be contiguous to a reflecting plate or may form with the surrounding fluid (as air) a reflecting surface (by reason of the different dielectric constants of the structure material and air) so that the impinging waves pass through the wave modifying structure twice, once on the way to the reflecting surface and then returning therefrom, in going to or from the active antenna, thus forming a reflecting lens. This subject matter is classified in indented subclass 755.

(2) Note. In the case of directors which are constructed of somewhat smaller dimensions than the resonant active antenna with which they have a parasitic relationship, so that the phase retardation at the ends or edges of the director sharpens the beam resulting in a type of "focusing" action, the impinging electromagnetic wave cannot be said actually to pass therethrough; and antennas with such directors are therefore not classified herein but in subclasses 815, 817, 819, and 833.

(3) Note. When the active antenna is a wave type guide horn, the term "spaced" means physically removed externally from the mouth of the horn. A lens at the mouth of the horn and forming a closure

for this mouth is not deemed "spaced" as here used, but is classified in subclass 783 below. The term "external" means on the outside of the active antenna.

(4) Note. An active antenna with a so-called diffractor, which produces an interference pattern is classified here, if the diffractor transmits electromagnetic wave energy. If the diffractor is opaque to such energy, classification is on other characteristics, such as in subclass 833 if the director function is performed and in subclasses 834+ if the reflector function is performed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

756, for antennas with polarization filters or converters.
783, for wave guide type antennas having internal wave refraction means.
784, for wave guide type antennas with closures.
785, for wave guide type antennas composed of dielectric rods, e.g., polystyrene rods.
872+, for antennas having a housing or protective covering which may be of material having refracting properties.
909+, for refracting means and radiant energy filters, per se.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, particularly subclasses 245+ for transmission line elements and components which may be refractors in a transmission line.
359, Optics: Systems (Including Communication) and Elements, subclasses 642+ for optical lenses.
362, Illumination, subclasses 326+ for illumination type refractors.

754 This subclass is indented under subclass 753. Subject matter wherein structure is included which permits or effects scanning, sweeping, or orienting of the antenna beam.

(1) Note. See (4) Note under subclass 757 for the significance of the terms "scanning", "sweeping" or "orienting".

(2) Note. Usually the scanning, sweeping or orienting is obtained by relative motion between the active antenna and the refractor, or by controlling the coupling of the active antennas associated with the refractor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5+, and 100+, for reflected and/or otherwise returned wave systems and directive radiant energy systems, respectively, which may involve a spaced external wave refractor and means for scanning, sweeping or orienting.
757, for antennas having means for moving the antennas for scanning, sweeping or orienting.
768, for slot type antennas with periodic control of the slot or coupling which may involve scanning, sweeping or orienting.
777, for plural wave guide type antennas with control of the individual antenna.
780, for pillbox type antennas which may be adapted for scanning, sweeping or orienting.
839, for antennas wherein the reflector and active antenna are relatively movable.
854, for antennas in general with an adjustable coupling network.

755 This subclass is indented under subclass 753. Subject matter including a reflector, or wherein the refractor is also adapted to perform a reflecting function.

(1) Note. For definitions of a reflector per se and associated with an active antenna, see subclasses 912 and 834, respectively.

(2) Note. The reflector may be spaced from the refractor or may be contiguous with the refractor to form a backer for the refractor. Further, the refractor may inherently reflect the impinging radio waves at a surface opposite to that where the waves impinge, due to differences which may exist in the refractor material and that of the contiguous or surrounding material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

775, 779, 780, and 781+, for wave guide type antennas with reflectors.

815, 817 and 818+, for center-fed balanced doublets with reflectors.

832, for an active antenna as a reflector.

834+, for antennas in general with parasitic reflectors.

909+, for refracting means, per se, together with a reflector.

912+, for reflectors, per se,and for definition of a reflector.

SEE OR SEARCH CLASS:

362, Illumination, subclasses 327+ for combined illumination reflectors and refractors.

756 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with structure which acts directly on the radio wave to filter out wave energy of an undesired polarization or to modify the polarization pattern of the wave.

(1) Note. The polarizing structure is usually a series of parallel rods (polarization grating) through which the waves pass or from which impinging waves are reflected. The polarizing structure may be spaced from or within the antenna, such as, in the latter case, within a wave guide horn or within a dielectric rod antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

753+, for active antennas with spaced electromagnetic refractors which may also include polarization modifying means.

909+, for refracting means and radio wave filters, per se, including polarization modifying means.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclass 21 for wave mode converters.

359, Optics: Systems (Including Communication) and Elements, subclasses 483+ for optical polarizers.

362, Illumination, subclass 19 for illuminating means combined with polarization means.

757 This subclass is indented under subclass 700. Subject matter wherein the complete antenna is movably (e.g., pivoted or rotatably) supported for motion as a unit or wherein the reflector and antenna are supported to be relatively movable, together with structure that effects or is peculiarly adapted to effect motion of the antenna or relative motion between the antenna and reflector in such fashion that the radiation pattern is scanned, swept or oriented.

(1) Note. An adjustable support for an antenna or reflector which permits an antenna beam to be scanned, swept or oriented is classified in subclasses 880+ below. For classification in this subclasses (757+), there must be some structure which positively acts, or may be actuated to produce this beam scanning, sweeping or orienting. Examples of such structure are a motor, crank or handle, or a mechanism connecting such motor, crank, or handle to an antenna or reflector.

(2) Note. For classification in this subclass the entire antenna must move on its support or there must be relative motion between the antenna and reflector on their support or supports. Mere motion of a part of the antenna, such as a mechanical change in the relative position of antenna parts in the coupling path for such purposes as switching or changing the electrical characteristic of the radiated energy, is not sufficient for classification here, but would involve such subclasses as 854 and 876, below.

(3) Note. An adjustable support together with means for effecting positive adjustment of the antenna for purposes other than scanning, sweeping or orienting, such as raising or lowering the antenna is not classified here, but in subclasses 880+ below.

(4) Note. Sweeping an antenna beam usually involves moving the antenna beam repeatedly along a single line (which

may be straight or curved) in space. Scanning such a beam usually involves repeatedly moving the beam over an area in space. Orienting usually involves mere change of the direction of the antenna beam.

(5) Note. Where in addition to directional modification of the beam means are claimed whereby a distinctive signal or signals associated with the received radio wave energy and indicating or denoting direction are involved, classification is not in this subclass but in Class 342, subclasses 350+, above.

(6) Note. For classification in this and indented subclass, there must be recited in the claims antenna details relating to the signal energy path, for example, details of the active antenna or reflector such as dipole antenna, parabolic reflector. The recitation of both an antenna and reflector by name only in a claim is considered a recitation of details of the radiant energy structure for classification in this subclass. Recitation of an antenna by name only or a reflector by name only in combination with means for moving the antenna or reflector is not sufficient for classification in this subclass but is classified in the appropriate class taking the means for moving, such as Class 74, Machine Element or Mechanism, for mechanical motions, Class 318, Electricity: Motive Power Systems, for motor controls, Classes 211, Supports: Racks, and 248, Supports, for adjustable supports.

SEE OR SEARCH THIS CLASS, SUBCLASS:

754, for antennas with spaced or external radio wave refractor, e.g., lens, with means for scanning, sweeping or orienting.

768, for slot type antennas with periodic control of the slot or coupling which may involve scanning, sweeping or orienting.

777, for plural wave guide type antennas with control of the individual antennas which may involve scanning, sweeping or orienting.

816, for plural balanced doublets with a coupling network wherein the coupling network may be controlled for scanning, sweeping or orienting.

839, for antennas wherein the reflector and active antenna are relatively movable.

854, for plural antennas with adjustable coupling networks which may involve scanning, sweeping or orienting.

869, for loop type antennas with rotatable supports.

876, for antennas with switching between the antennas and lines which may involve scanning, sweeping or orienting.

882, for antenna with pivoted or rotatable supports.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, particularly subclass 1 for mechanical movements for antennas. See also (6) Note, above.

174, Electricity: Conductors and Insulators, subclass 86 for conduits, cables and conductors with angularly movable or adjustable joints.

211, Supports: Racks, and 248, Supports, for supports which permit movement of the article supported. See also (6) Note, above.

318, Electricity: Motive Power Systems, for motor controls. See also (6) Note, above.

333, Wave Transmission Lines and Networks, subclasses 245+ for long line elements and components which may include rotatable couplings.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar Radio Navigation), subclasses 1 through 205 and subclasses 350+ for reflected or otherwise returned wave system and directly radio wave energy systems, respectively, which may involve means for moving a directive antenna.

362, Illumination, for illuminating means, particularly subclasses 37+ for dirigible light supports.

758 This subclass is indented under subclass 757. Subject matter combined with another relatively movable antenna, together with structure

that effects relative motion between the complete antennas or between the active antenna portions or the reflectors.

(1) Note. The plurality of antennas may have individual reflectors or a common reflector.

SEE OR SEARCH THIS CLASS, SUBCLASS:

879, for plural antennas with a support therefor.

893, for plural antennas in general. See also the Search Notes thereunder for a field of search pertinent to plural antennas.

759 This subclass is indented under subclass 757. Subject matter wherein the directive antenna is supported for movement of the axis of its beam over a spiral path and wherein the means for moving includes structure which causes the antenna to move its beam axis cyclically over a spiral path.

(1) Note. If the means for moving is such that it only may be manipulated to move the axis of the antenna over a spiral path, as for example, an antenna mounted for azimuthal rotation and nod together with a handle, classification is not here, but in such subclasses as 761 or 765 below. For classification in this subclass, the moving means must be effective to maintain the antenna continuously repeating the same spiral scanning movement.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, subclass 1 for complex mechanical movements for moving an article, which may be an antenna, for scanning or sweeping.

760 This subclass is indented under subclass 757. Subject matter together with signal, alarm, or indicator structure which is responsive to the scan, sweep or orientation of the antenna, independent in its operation from the collected or radiated signal.

(1) Note. For classification in this subclass the signal, indicator or alarm structure must be claimed in combination with the means for moving the directive antenna for scanning, sweeping or orienting to indicate some function or result of such motion of the antenna, as for example, direction of the antenna or angle swept through by the antenna; as opposed to subclass 894 where general signal indicator or alarm structure combined with an antenna for indicating some condition of the antenna is classified.

(2) Note. Where an indicator is claimed broadly in combination with an antenna and means for moving such antenna, although such indicator is disclosed as not only showing a condition of the antenna, as the position of its sweep or scan from point to point but also as showing some condition in response to a received signal (as in a cathode-ray tube, the location of a remote signal), such subject matter is not classified in this subclass but as a direction finding receiver under this Class 342, subclasses 417+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

703, for measuring the antenna signal energy.

894, for antennas with indicator, signal or alarm structure in general. See also (1) Note, above.

SEE OR SEARCH CLASS:

116, Signals and Indicators, for mechanical signal, alarms and indicators in general.

340, Communications: Electrical, for electrical signaling devices in general.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 and subclasses 350+ for reflected wave and directive, which may involve antenna indicators. See also (2) Note above.

761 This subclass is indented under subclass 757. Subject matter wherein the reflector and active antenna are supported to be relatively movable, together with structure that effects or is pecu-

liarly adapted to effect relative motion between the antenna and reflector element.

(1) Note. Usually the patents in this subclass involve a parabolic reflector and active antenna in an unsymmetrical relationship, which upon rotation produce conical scanning.

(2) Note. The term reflector as used in this subclass includes any parasitic element such as a director.

SEE OR SEARCH THIS CLASS, SUBCLASS:

759, for active antennas and reflectors which may be relatively movable to produce a spiral scan.

839, for antennas with reflectors which are relatively movable for purposes other than scanning sweeping or orienting, such as focusing or changing the beam pattern; or where no means is claimed for moving the antenna and reflector relatively for scanning, sweeping or orienting.

762 This subclass is indented under subclass 757. Subject matter wherein the active antenna is of the wave guide type as defined in subclass 772 below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

759, for antennas of the wave guide type together with means for moving the antenna or the reflector in a spiral path.

761, for antennas of the wave guide type having a reflector together with means for moving the reflector and antenna relative to each other.

772+, for wave guide type antennas, per se.

763 This subclass is indented under subclass 757. Subject matter wherein the antenna is rotatably supported together with structure for imparting continuous or oscillating angular motion to the complete antenna as a unit relative to its support.

(1) Note. When means for rotating the antenna is a hand operated control level or linkage system and the antenna is claimed by name only classification is elsewhere (see the Search Class notes below); otherwise (when antenna details are claimed), classification is herein.

(2) Note. For classification in this or indented subclasses the claimed combination of the antenna and the means to impart rotary motion thereto must include detailed antenna structure as opposed to the mere recitation of an antenna or reflector by name only. In the latter case classification is with the type of combination claimed for imparting motion (see the Search Class notes below).

SEE OR SEARCH THIS CLASS, SUBCLASS:

761, for antennas with means for moving the reflector and antenna relative to each other.

869, for loop type antennas with a rotatable support.

882, for antennas with a pivoted or rotatable support.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, particularly subclasses 1 and 491, for hand operated control lever and linkage systems. See (1) and (2) Notes, above.

192, Clutches and Power-Stop Control, for clutches and power stop controls. See (2) Note, above.

318, Electricity: Motive Power Systems, for motor control systems wherein the motor may move an antenna.

764 This subclass is indented under subclass 763. Subject matter wherein the rotatable antenna is of the loop type as defined in subclass 866, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

866+, and the search notes thereunder for loop type antennas, per se, and particularly subclass 869 for such antennas with rotatable supports.

765 This subclass is indented under subclass 763. Subject matter wherein the antenna is supported for rotation in different planes (i.e., rotatable about two or more angularly disposed axes) together with structure for imparting continuous or oscillating angular motion to the antenna as a unit in these planes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

759, wherein the antenna may be rotated in different planes to cover a spiral path.

766 This subclass is indented under subclass 763. Subject matter wherein the means imparting motion to the antenna is a motor.

(1) Note. The term motor as used above contemplates all devices other than manual for imparting motion to the antenna. The motor is usually electrical, but may be of another type such as fluid. To be classified herein the motor must be claimed as such, or as a means to rotate the antenna, or some similar recitation. Subject matter involving manual means to impart motion when combined with a rotatable antenna for scanning, sweeping or orienting is not classified herein but in subclass 763, above. As distinct from a motor drive, a manual drive is usually structure such as a handle, affording means to apply the manual force. In this latter case where the antenna is claimed by name only and involves, for example, a handle and mechanical motion transmitting means, classification is in Class 74 and not herein.

(2) Note. For classification in this subclass the claimed combination of the motor and antennas must include detailed antenna structure as opposed to the mere recitation of the antenna or reflector by name only. In the latter case, classification is with the motor if the motor is claimed in detail. For example, subject matter involving a combination of an electric motor for rotating an antenna for scanning, sweeping or orienting, motor control, and antenna, where the antenna is claimed by name only, is not classified herein. The Search Class section below contains a list of the classes involving motors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

765, where one or more motors may be used to effect rotary motion of the antenna in different planes.

SEE OR SEARCH CLASS:

60, Power Plants, (see (2) Note above).
91, Motors: Expansible Chamber Type, (see (2) Note above)
123, Internal-Combustion Engines, (see (2) Note above)
170, Motors, Fluid Current, (see (2) Note above)
185, Motors: Spring, Weight, or Animal Powered, (see (2) Note above)
253, Motors, Fluid, (see (2) Note above)
290, Prime-Mover Dynamo Plants, (see (2) Note above)
310, Electrical Generator or Motor Structure, (see (2) Note above)
318, Electricity: Motive Power Systems, for subject matter involving a combination of an electric motor for rotating an antenna for scanning, sweeping or orienting, motor control, and antenna, where the antenna is claimed by name only (see (2) Note above).

767 This subclass is indented under subclass 700. Subject matter including a conducting surface, such as a metallic sheet which may be flat or curved, and an aperture in the surface, which may be completely surrounded by the surface or extended inwardly from an edge of the surface, together with coupling means which establishes a potential difference at spaced points along the aperture or extracts received energy from these points, these points usually being across the aperture, the surface furnishing a conductive path between these spaced points to permit current to flow therebetween.

(1) Note. In the event the gap completely separates the surface into two parts with the spaced points being across the gap, an electrical short circuit must be provided across the gap as by a galvanic connection or a resonant short circuiting line.

(2) Note. The slot is usually resonant (e.g., a half wave length long, or a perimeter of one wave length) to present a high slot impedance across the coupling thereto.

(3) Note. Antennas having an aperture in a conductive surface, wherein the aperture is used merely for coupling the energy to an antenna are not classified here but in the appropriate subclass below, for example, subclasses 772+ for wave guide type antennas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

741+, for high frequency loops, wherein the loop may be formed of a conductive sheet having a slot-like space between the adjacent ends.

772+, for wave guide type antennas. See (3) Note, above.

789, for antennas within a conductive apertured wall.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, particularly subclasses 208+, 239+ and 248+ for resonant slots in wave guides.

768 This subclass is indented under subclass 767. Subject matter wherein structure is provided for modifying the transmission characteristic of a slot or its coupling, the structure being normally operated in a cyclical or repetitive manner.

(1) Note. Examples of the subject matter of this subclass are variable width wave guide coupling, or variable length wave guide coupling, or a movable shutter in front of or behind the slot or in the wave guide coupling. The purpose of this modification of the transmission characteristic is usually for scanning, sweeping or orienting the antenna pattern.

(2) Note. In the subject matter of this subclass physical motion of parts of the antenna may occur for control of the transmission characteristic for scanning, sweeping or orienting the pattern. However, where the antenna and/or its reflector moves as a unit or where relative motion occurs between the active antenna and its reflector for scanning, sweeping or orienting the antenna pattern, classification is in subclasses 757+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

757+, for directive antennas with means for moving the antenna for scanning, sweeping or orienting. See also (2) Note, above.

777, for plural wave guide type antennas with control of the individual antennas.

854, for antennas with adjustable coupling.

876, for antennas with switching between the antennas and the associated lines.

SEE OR SEARCH CLASS:

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar Radio Navigation), subclasses 422+ and subclasses 428+ for direction finding receivers with effectively moveable directional patterns.

769 This subclass is indented under subclass 767. Subject matter wherein the aperture is shaped as a narrow annulus on a flat conducting surface or a band removed from the wall of a conducting cylinder.

(1) Note. Usually the opposing walls of the aperture are electrically connected at a point remote from the coupling.

770 This subclass is indented under subclass 767. Subject matter including two or more apertures in a surface, or two or more surfaces each having at least one aperture, all as defined in subclass 767, above.

(1) Note. A single physically continuous slot composed of a plurality of discrete and separately identifiable sections is classified in this subclass, if each section operates separately and independently as a slot antenna. For example, a zigzag slot where each straight section is in itself a separate resonant slot is classified in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

768, for plural slot type antenna with periodic control of the slot or its coupling.
774, for stacked bi-conical horn antennas.
776+, for plural wave guide type antennas in general.
893, and the Search Notes thereunder, for plural antennas in general.

771 This subclass is indented under subclass 770. Subject matter wherein at least one of the apertures is combined with a wave guide (or resonant cavity) for energizing the aperture or conducting energy therefrom.

(1) Note. The wave guide must perform the coupling function. Plural slot antennas wherein the apertures are directly fed by a transmission line connected to the opposite edges of the slot, and having a resonant cavity in back of the aperture as a reflecting means for confining the energy in one direction but not performing the coupling function, are not classified in this subclass but in subclass 770, above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

762, for moving wave guide type antennas with means for moving, scanning, sweeping or orienting.
772+, for wave guide type antennas.
853+, for plural antennas with a coupling network.
844, for plural antennas in general spaced a fractional or full wave length apart.

772 This subclass is indented under subclass 700. Subject matter wherein a wave guide is provided between free space and a generator or receiver of radio wave energy, or between free space and a nonwave guide coupling or connecting structure which establishes in or collects from the wave guide radio wave energy, the wave guide constraining this energy in its passage to or from free space, and being directly connected with free space without any intervening nonwave guide coupling (such as a probe and dipole).

(1) Note. The guide may be a cavity resonator, or a horn.

(2) Note. The wave guide must guide the wave energy between free space and the nonwave guide coupling, oscillator or receiver for classification in this subclass.

(3) Note. Usually the wave guide has a configuration or structure which substantially matches the impedance to that of free space, such as a horn.

SEE OR SEARCH THIS CLASS, SUBCLASS:

762, for wave guide type antennas with means for moving the antennas for scanning, sweeping or orienting.
767+, for slot type antennas which may involve wave guide structure.

SEE OR SEARCH CLASS:

181, Acoustics, for mechanical acoustical devices which collect or emit sound waves to or from an unconfined space containing a sound conducting medium.
219, Electric Heating, subclasses 678+ for microwave heating.
333, Wave Transmission Lines and Networks, particularly subclasses 1+, 227 and 239, for wave transmission lines and networks involving wave guides and cavity resonators.

773 This subclass is indented under subclass 772. Subject matter wherein the wave guide has its opposing surfaces formed as conical or flared surfaces of revolution on a common axis, the spacing between the surfaces increasing from the apices towards the peripheries, the coupling to the source or collector extending from the apices, as by a coaxial line or wave guide, through one of the surfaces of revolution, the surfaces guiding the wave energy between the apices and the peripheries.

(1) Note. The patents of this subclass resemble somewhat in structure the sleeve and ground plane antennas of subclasses 790+ and 829+. However, in this subclass (773) the opposing surfaces act

merely as a wave guide; while in the other two subclasses this wave guide action is not present, but one or both of the surfaces acts directly as a radiator or collector of radio wave energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:

786, for wave guide type antennas with horns.

790+, for sleeve type antennas. See also (1) Note, above.

807, for tapered balanced doublet antennas.

809, for fractional, multiple or full wave type antennas including grounding structures. See also (1) Note, above.

774 This subclass is indented under subclass 773. Subject matter wherein a plurality of bi-conical horn type antennas as defined in subclass 773 above are spaced along a common axis, their respective axes coinciding with the common axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

776+, for plural wave guide antennas in general.

884, for antennas with a transmission line or wave guide as a support.

775 This subclass is indented under subclass 773. Subject matter wherein the bi-conical horn type antenna as therein defined is combined with external conductive structure which reradiates into free space impinging radio waves coming from or going to the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

755, for antennas with spaced radio wave lenses or diffractors and reflectors.

779, for plural wave guide type antennas generally with a reflector.

780, for "pillbox" type antennas.

781+, for single wave guide type antennas with a reflector.

834+, and the Search Notes thereunder, for antennas with reflectors in general.

912+, for reflectors, per se.

776 This subclass is indented under subclass 772. Subject matter wherein two or more wave guides are provided at the connection to free space to result in two or more wave guide paths each directly coupled to free space.

(1) Note. The wave guides may be formed as branches from a common guide remote from the free space coupling end, or may be separate and distinct guides independently coupled by non-wave guide structure to their transmitter and/or receiver, or may be merely a divided guide such as a baffled horn with separate wave guide paths existing on each side of the baffle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

773+, for bi-conical horn type antennas.

844, for plural antennas spaced a fractional or full wave length apart.

853+, for coupling networks for plural antennas.

879, for supports for plural separate antennas.

893, and the Search Notes thereunder, for plural antennas in general.

777 This subclass is indented under subclass 776. Subject matter wherein at least one antenna has in its wave guide path or its coupling to the transmitter or receiver, structure such as a switch or adjustable impedance, which alters the amplitude or phase of the energy passing through the path or coupling to modify the radiation or polarization pattern of the antenna.

(1) Note. Included here are plural wave guide antennas having switches in the coupling paths for lobbing the antenna beam, or having variable impedance in the coupling paths for steering the composite beam from the antennas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

757+, for antennas having means for moving the antennas for scanning, sweeping or orienting.

768, for slot type antennas with control of the slot or coupling.

854, for antennas in general with adjustable coupling networks.
876, for antennas with switching between the antennas and the associated lines.

SEE OR SEARCH CLASS:
333, Wave Transmission Lines and Networks, subclasses 2+ for plural channel wave transmission systems with automatic control, and subclasses 101+ for branched wave transmission lines with switching.
342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar Radio Navigation), subclasses 385+ wherein a distinctive signal is sent or received denoting course, direction, or orientation.

778 This subclass is indented under subclass 776. Subject matter wherein the wave guide or coupling path of the respective antennas have significant phase characteristics in the transmission of energy therethrough, to modify the relative phase relationship of the transmitted radio wave energy of the respective antennas at their coupling to space, or to modify the relative phase relationship of the received radio wave energy in passing through the antennas and/or coupling paths.

(1) Note. The different phase characteristic is usually secured by a delay network in the coupling path of one of the antennas or a dielectric delaying mass in the wave guide path of one of the antennas.

SEE OR SEARCH THIS CLASS, SUBCLASS:
844, for plural antennas spaced a fractional or full wave length apart.
853+, for plural antennas with coupling in general.

SEE OR SEARCH CLASS:
333, Wave Transmission Lines and Networks, subclasses 100+ for branched wave transmission lines and networks which may involve phasing.

779 This subclass is indented under subclass 776. Subject matter wherein the plural wave guides as defined therein are combined with external conductive structure (usually metallic) which reradiates into free space impinging radio waves coming from or going to the wave guides.

SEE OR SEARCH THIS CLASS, SUBCLASS:
775, for bi-conical horn type antennas with a reflector.
780, for "pillbox" type antennas.
781, for single wave guide type antennas with an external reflector or director.
834+, and the Search Notes thereunder, for antennas with parasitic reflectors in general.

780 This subclass is indented under subclass 772. Subject matter wherein the wave guide includes two parallel plates which are closed along a portion of their perimeter by a reflector, the spacing between the plates being small compared to their surface dimensions, the plates being electrically open to free space over a relatively large portion of their perimeter.

SEE OR SEARCH THIS CLASS, SUBCLASS:
781+, for wave guide type antennas with a reflector or director.
834+, and Search Notes thereunder, for antennas with parasitic reflectors in general.
912+, for reflectors or directors, per se.

781 This subclass is indented under subclass 772. Subject matter wherein the wave guide antenna as defined therein is combined with external conductive structure (usually metallic) which reradiates into free space impinging radio waves coming from or going to the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:
755, for antennas with spaced radio wave lenses or diffractors and reflectors.
775, for bi-conical horn type antennas with a reflector.
779, for plural wave guide type antennas with a reflector.
780, for "pillbox" type antennas.
833, for antennas with directors in general.
834+, and the Search Notes thereunder, for antennas with reflectors in general.
912+, for reflectors or directors, per se.

782 This subclass is indented under subclass 781. Subject matter wherein structure or arrangement is provided to reduce reflection or the effect or reflection of the transmitted wave energy from the reflector back into the active transmitting antenna.

(1) Note. This effect is sometimes referred to as matching the reflector to the active antenna. The effect is obtained, for example, by means of a second compensating reflector or tilting the antenna with respect to the reflector.

SEE OR SEARCH THIS CLASS, SUBCLASS:

762, for wave guide type antennas with means for moving the antenna for scanning, sweeping or orienting.

837+, for antennas with plural reflectors, particularly subclass 838, where one of the reflectors is a screening reflector.

841, for antennas with electrical shields.

862+, for antennas with coupling networks for impedance matching of an antenna to its coupling means, which include long line elements.

912+, for reflectors, per se.

783 This subclass is indented under subclass 772. Subject matter wherein the wave guide contains a mass (usually dielectric) which freely passes radio waves, and which is shaped or positioned to delay or accelerate waves passing therethrough an amount which varies over the wave front for such purposes as focusing, changing direction, or changing the wave front as from circular to planar.

SEE OR SEARCH THIS CLASS, SUBCLASS:

753+, for antennas having spaced radio wave lenses or diffractors associated therewith.

756, for antennas having polarization filters associated therewith.

785, for dielectric wave guide type antennas.

909+, for refracting means and radiant energy filters (e.g., lenses and polarizers), per se.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, particularly subclasses 239+ and 248+, for wave guides having lenses or refracting means.

784 This subclass is indented under subclass 772. Subject matter wherein the wave guide has a mass extending across the wave guide adjacent the end coupling the wave guide to free space, the mass being of material which freely passes electromagnetic wave energy.

(1) Note. The purpose of this mass is usually protection against weather, sealing the interior of the guide, or matching the guide to free space.

SEE OR SEARCH THIS CLASS, SUBCLASS:

789, for antennas within an apertured wall, which may have a closure.

872+, for antennas with housings or protective coverings.

785 This subclass is indented under subclass 772. Subject matter wherein the wave guide is formed of an elongated dielectric mass, which may be hollow, the source or receiver of energy being adjacent one end of the mass and the coupling for radiation to or from free space occurring along the sides or at the other end.

(1) Note. By dielectric is meant a material having a dielectric constant materially greater than air.

(2) Note. The mass may be a solid, or confined gas or liquid. This dielectric mass should be the essential conductor of the electromagnetic waves between the source or receiver of the energy and free space. A dielectric mass in a wave guide antenna which merely modifies the characteristic of the energy passing through the guide, the guide itself being the essential conductor, is not classified in this subclass but in subclass 783.

SEE OR SEARCH THIS CLASS, SUBCLASS:

753+, for antennas with spaced radio wave lenses or diffractors which may be of dielectric material.

776+, for plural wave guide antennas which may be of the dielectric type.

783, for wave guide antennas with internal dielectric refracting means. See also (2) Note, above.

907+, particularly subclasses 909+, for antenna components which may be constructed of dielectric materials.

786 This subclass is indented under subclass 772. Subject matter wherein the wave guide diverges, or flares, in at least one dimension towards free space.

(1) Note. While in a horn a reflecting function may be performed, the general purpose of the confining walls between the emitter or collector and the mouth of the horn is for guiding the energy to or from the emitter or collector and the mouth, while reflectors as in subclasses 834+, etc.., do not perform this guiding function but merely reradiate the impinging energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:

762, for horn type antennas with means for moving the antenna for scanning, sweeping or orienting.

773+, for biconical type horns.

776+, for plural horns, or sectionalized horns, having two or more wave guide paths.

784, for horns with closures.

834+, and 912+, for antennas with reflectors, and reflectors, per se, respectively. See (1) Note, above.

SEE OR SEARCH CLASS:

181, Acoustics, subclasses 177+, for megaphones.

787 This subclass is indented under subclass 700. Subject matter including magnetic material which modifies the inductance of the active portion of the antenna.

(1) Note. The magnetic material may be in the path of the radio waves to or from the active portion of the antenna, or in a permanent magnet or energized magnet which increases the magnetic field around the active portion of the antenna.

(2) Note. Magnetic material in the coupling circuit, such as a magnetic core coupling transformer, is not sufficient for classification here. Such subject matter with an antenna in general is found in subclasses 850+, below.

(3) Note. See (2) Note under subclass 866 below for the line between loop antennas and the inductor devices classified in Class 336, Inductor Devices.

SEE OR SEARCH THIS CLASS, SUBCLASS:

745+, for antennas with reactance for tuning the antenna.

850+, for antennas having a coupling network or impedance in the leadin which may involve inductors having magnetic material such as iron cores.

SEE OR SEARCH CLASS:

336, Inductor Devices, appropriate subclasses for inductors involving magnetic material, and subclass 110 where the inductor is combined with a permanent magnet.

788 This subclass is indented under subclass 787. Subject matter wherein the active antenna comprises a coil of one or more turns adapted to be connected at its ends to a pair of leadin terminals.

(1) Note. For a field of search pertinent to loop antennas see the Notes under subclass 866, below.

789 This subclass is indented under subclass 700. Subject matter wherein a definite space is provided beneath an aperture in a conducting surface, and at least one antenna is mounted in the space with its active portion at least partially beneath the surface to transmit or receive radio wave energy when so mounted.

(1) Note. The subject matter in this subclass usually involves an antenna mounted in a recess below the skin of an airplane to avoid the air currents. The recess may be covered, as by an insulating cover which passes radio wave energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:

702, for antennas with significantly related cabinet structure.

705+, and 709+, for antennas with significantly related aircraft or watercraft structure, respectively.

767+, for slot type antennas.

872+, for antennas with housings in general.

889, for rod type antennas retractable into a support.

790 This subclass is indented under subclass 700. Subject matter wherein an active antenna element, which may be a complete antenna or a portion of one (such as an arm of a dipole), is formed as a cylinder, prisms, or frustum of a cone or prism, or defines such a surface (such as series of circularly arranged parallel wires), is combined with a feed line which supplies radiating energy to or from this antenna element or to or from another antenna element; and which enters the cylinder at one end and extends within the cylinder at least a portion of the distance to the other end; and where the feed line is electrically coupled to this cylinder the coupling is remote from the entrance end, there being a substantial insulating space between the inner surface of the sleeve and the portion of the feed line extending within the cylinder.

(1) Note. The feed line may be the feed to the sleeve element, or to another active element, or to both. The feed line may also be a support for the sleeve element or for other antenna elements. The feed line may be the ground return, such as the connection to the outer conductor of a coaxial line where the inner conductor is connected to any portion of the active element.

(2) Note. In this subclass the feed line is spaced along its length from the inner surface of the sleeve, as opposed to the case of telescoping parts as in subclasses 823 and 901+, wherein the parts are in substantial engagement over their telescoping length. Further, in these last mentioned subclasses, the feeding portion usually surrounds the free end portion.

(3) Note. The sleeves forming active antennas of this subclass are distinguished from superficially similar sleeves as found in subclass 830 in that the latter sleeves form ground planes performing no active function as collectors or emitters of radiation (though they usually have reflecting properties); whereas the sleeves of this subclass are active radiators or collectors of radiation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

773, for bi-conical horn wave guide type antennas.

807, for doublets whose active elements are thick or enlarged to form a sleeve.

823, for doublet type antennas having telescoping arms. See (2) Note, above.

830, for fractional, multiple or full wave linear antenna with grounding structure, and having coaxial feed line. See (3) Note, above.

884, for antennas where a plural wire transmission line or wave guide is the support.

901+, for rod type telescoping antennas. See (2) Note, above.

791 This subclass is indented under subclass 790. Subject matter wherein an active rod, which may be hollow, forms an extension of and is electrically connected to the feed line and is coaxial with the active sleeve.

(1) Note. The active rod and sleeve are often in electrical effect a doublet as defined in subclass 793 below; but are structurally different in that the rod and sleeve are not similar. The rod is usually of a smaller diameter than the sleeve.

SEE OR SEARCH THIS CLASS, SUBCLASS:

725, for plural separate diverse type antennas. See also (3) Note, under subclass 725.

801, for doublet antennas formed of three or more collinear elements.

823, for doublet antennas with telescopically arranged respective arms. See (3) Note under subclass 790, above.

827, with collinear arranged fractional, multiple or full wave length linear type antennas.

830, for linear type antennas with ground planes fed by coaxial lines. See (3) Note under subclass 790, above.

792 This subclass is indented under subclass 790. Subject matter wherein the sleeve is combined with a mass having a substantially similar external shape, and wherein the sleeve and mass are fed in balanced relation, at least one of the feed lines extending from one end within the sleeve at least a portion of the distance to the other end.

SEE OR SEARCH THIS CLASS, SUBCLASS:

791, for sleeve type antennas having in addition a rod type radiator.

793+, for balanced doublet type antennas in general, particularly subclass 802 for such antennas with distributed reactance, subclass 807 for such antennas thick or enlarged, and subclass 823 for such antennas having telescoping arms.

792.5 This subclass is indented under subclass 700. Subject matter including a series of electrically coupled radiating masses spaced along an axis of the antenna, the spacing of the masses from a fixed point on the axis and a dimension of corresponding masses progressively increasing along the axis in a manner approximating a geometrical or logarithmic progression.

(1) Note. The ratios of the spacing and dimension of respective radiating masses are usually substantially equal. The radiating masses are usually dipoles.

SEE OR SEARCH THIS CLASS, SUBCLASS:

807, for dipoles with tapered arms.

811, for fish bone type dipole antennas.

793 This subclass is indented under subclass 700. Subject matter wherein two active conducting masses, which are substantially alike, are physically symmetrically disposed on opposite sides of electrically balanced, antenna lead-in terminals, each of the masses being connected to a respective terminal.

(1) Note. The term “active conducting masses” above is construed to exclude antenna components such as counterpoises.

(2) Note. The radiating masses are deemed substantially alike, if one mass has a nonradiating attachment such as a support to constitute a nonsymmetrical structure. It is only necessary that the radiating portions be substantially alike to meet this requirement in the definition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

726, and 727, for plural separate diverse type antennas which include balanced doublets.

730, for plural diverse type antennas using the same active element including balanced doublets.

731+, for traveling wave type antennas which may include balanced portions.

740, for antennas of the balanced type with a terminating resistance at the open end.

741+, for high frequency loop type antennas which may be composed of a plurality of doublet type antennas.

747, for antennas of the balanced doublet type with variable reactance for tuning.

749+, for antennas with lumped reactance for loading which may include a balanced doublet.

792, for doublet type antennas including an active sleeve which surrounds the feed line.

824, for planar arrays of linear antennas.

825+, for fractional, multiple, or full wave length linear type antennas.

865, for balanced antennas in general with a balanced coupling network.

794 This subclass is indented under subclass 793. Subject matter including two doublets as defined respectively in two of the subsequent subclasses 795, 801, 802, 803, 804, 805, 806, 808, 809, 811, and 823, or wherein two doublets each within the scope of subclass 793 above, have structurally different radiating masses to present significantly different electrical properties or radiation properties.

(1) Note. A mere difference in size with changed electrical or radiation properties normally following from such difference in size is not sufficient to constitute diverse type doublets within the definition.

(2) Note. Two groups of doublets, which doublets are in themselves not diverse in type but which groups have significantly different arrangements such as plural crossed or plural circumferentially arranged, are not classified in this subclass, but in the pertinent plural subclasses of doublets, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

724, for antennas convertible to different types of antennas, which may include conversion of one type of doublet to another type of doublet or from a doublet to another type of antenna.

726, and 727, for plural separate diverse type antennas which include a doublet type antenna.

730, for plural separate diverse type antennas using the same active element including a doublet type antenna.

795 This subclass is indented under subclass 793. Subject matter wherein the conductive masses are each formed as a sheet, or each formed as a closed portion (e.g., closed loop) defining a sheet-like surface.

(1) Note. The sheet may have openings therein, such as exist in a screen or grid. The closed portion may be formed by a conductor or series of conductors defining a closed path. Grid conductors may extend from spaced points on the closed portion, and lie in the plane of the closed portion. These antennas include types designated as fan, wing, sheet, grid or screen. A mere plurality of rods free at one end and joined at the other end is not classified here, but in such subclasses as 808 and 811, below. For classification here the rods must form a closed path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

803+, for folded doublets.

806, for doublets having bent arms.

808, for doublets with a plural-rod arm forming a V. See also (1) Note, above.

811, for fishbone type arrays.

824, for planar arrays of linear antennas.

897, for mesh, woven, braided or multiple strip type antennas.

796 This subclass is indented under subclass 793. Subject matter including a plurality of doublets spaced along an axis, an adjacent two of these doublets being similar and angularly spaced with respect to each other around the same axis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

742, for stacked high frequency loop type antennas.

776+, for plural wave guide type antennas.

798, for plural groups of crossed doublet antennas (e.g., turnstile).

800, for plural groups of circumferentially arranged doublet antennas.

878+, for supports for antennas, particularly subclasses 879 for supports for plural separate antennas, 884 where a wave guide or plural transmission line forms the support, 890 for antennas mounted on a post, standard or tower, and 892 for bracket supports for antennas.

797 This subclass is indented under subclass 793. Subject matter including at least two like doublets, the conductive masses of each doublet being elongated in shape and collinearly

arranged, the doublets crossing one another at their midpoints.

SEE OR SEARCH THIS CLASS, SUBCLASS:

799+, for plural circumferentially arranged doublets, and see also the search notes thereunder.

808, for single doublets, wherein each arm is formed as V.

798 This subclass is indented under subclass 797. Subject matter wherein a plurality of doublets as therein defined is combined with a second distinct plurality of doublets as therein defined.

(1) Note. Usually this subject matter involves two or more distinct radially arranged (crossed over doublets) stacked along a support. The arrangements of the respective pluralities of doublets of the array may be the same or different within the scope of subclass 797. See subclass 794 above for combinations of single doublets of diverse type.

SEE OR SEARCH THIS CLASS, SUBCLASS:

774, for stacked bi-conical horn type antennas.

796, for helically or angularly staggered plural dipoles.

800, for plural groups of plural circumferentially arranged antennas.

884, for antennas with plural wire transmission lines or wave guides as a support for the antenna.

799 This subclass is indented under subclass 793. Subject matter wherein at least three doublets have their midpoints arranged on the circumference of a circle and equally spaced around this circumference; or wherein three doublets so arranged are disclosed in the specifications, and it is claimed that a plurality of doublets have a circumferential arrangement, or are in circular array, or are in cylindrical formation, or equivalent terminology; or wherein at least two doublets are so arranged and have their arms so curved that all the arms lie in a circle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

741+, for high frequency type loops.

796, for helically or angularly staggered plural dipoles.

797+, for plural crossed doublets.

810+, for plural doublets.

824, for planar arrays of linear antennas.

826+, for plural multiple, fractional or full wave linear type antennas.

835+, for plural active antennas with parasitic reflectors.

844, for plural antennas spaced a fractional or full wave length apart.

853+, for plural antennas with a coupling network or impedance in the leadin.

879, for supports for plural separate antennas.

893, for plural antennas in general.

SEE OR SEARCH CLASS:

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 385+ for beacons which may involve circumferentially arranged doublets.

800 This subclass is indented under subclass 799. Subject matter wherein a plurality of doublets as herein defined is combined with a second distinct plurality of doublets as therein defined.

(1) Note. Usually this subject matter involves two or more distinct circularly arranged arrays stacked along a support. The arrangements of the respective pluralities of doublets may be the same or different within the scope of subclass 799. See subclass 794 above for combinations of single doublets of diverse type.

SEE OR SEARCH THIS CLASS, SUBCLASS:

742, for high frequency loop type antennas which may be in diverse planes and stacked.

774, for biconical horn type antennas which may be stacked.

796, for helically or angularly staggered plural doublets.

798, for plural groups of plural radially arranged doublets.

835+, for plural active antennas with reflectors.

884, for antennas with plural wire transmission lines or wave guides as a support for the antenna.

801 This subclass is indented under subclass 793. Subject matter wherein the active conductive masses are of elongated shape and are longitudinally divided into at least three discrete portions which are substantially aligned along their longitudinal axes.

(1) Note. The break at the antenna terminals may constitute one of the longitudinal divisions. The divisions (between discrete collinear portions) usually include some phasing means (e.g., a long line) to shift the phase between the separate portions.

(2) Note. Subject matter involving plural collinear doublets each as herein defined wherein the respective portions are cross-connected, instead of the respective doublets having their respective portions connected in series, is classified herein.

(3) Note. Subject matter wherein collinear doublets as herein defined have lumped reactance means between portions as for loading is classified in subclasses 749+, above; while where distributed reactance is included between portions, such subject matter is classified herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

722, for antennas with lumped reactance filters between antenna portions.
749+, for antennas with lumped reactance for loading. See (3) Note, above.
802, for doublet antennas with distributed reactance added to the arms.
813, for doublet antenna arrays in a parallel and collinear arrangement.
824, for planar arrays of linear antennas.
827, for fractional, multiple and full wave type antennas in collinear arrangement.

802 This subclass is indented under subclass 793. Subject matter wherein each conducting mass includes in addition to its own inherent reactance a distributed reactance in series or in shunt with the mass, at least a part of the distributed reactance being spaced on the radiating mass from the antenna lead-in terminals, i.e., the distributed reactance is not physically and electrically entirely disposed between the conducting mass and the antenna lead-in terminals.

(1) Note. This distributed reactance may result from an abrupt change in shape of the conducting mass, or from a portion extending from the main body of the mass such as a branch.

(2) Note. Subject matter wherein the arms of a doublet are merely adjustable in length without any nonuniformity or without any abrupt change in shape with its consequent loading effect is not classified herein, but in subclass 823 below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

744, for high frequency loop type antennas with series reactance in the loop path.
749+, for antennas with lumped reactance for loading.
801, wherein three or more collinear units form a doublet. See also the Notes under subclass 801.
806, for balanced doublets having bent arms.
828, for fractional, multiple, or full wave linear type antennas having a non-uniformity therein for reactive effect.
843, for antennas having an appreciable wave length dimension.
895, for spiral and helical type antennas.
899, for antennas with area increasing means (e.g., spiniferous).

803 This subclass is indented under subclass 793. Subject matter wherein the two active conductive masses include elongated conductors which extend outwardly from the antenna lead in terminals together with an additional elongated conductor or conductors extending along the length of and close to the first conductors to form a transmission line therewith, the first and second conductors being joined at the outer ends as by bending to present a substantially increased radiation resistance at the antenna lead in terminals.

(1) Note. While folded dipoles may form a closed circuit as do the high frequency loops in subclass 741 above, the conductors of the folded dipole are close together to form a transmission line, whereas the conductors of the high frequency loop are spaced further apart so that the closed circuit encloses a relatively larger area.

SEE OR SEARCH THIS CLASS, SUBCLASS:

741, for high frequency type loops. See also (1) Note, above.

804 This subclass is indented under subclass 803. Subject matter wherein the second conductors comprise a plurality of conductors in parallel.

SEE OR SEARCH THIS CLASS, SUBCLASS:

795, for wing type doublet antennas.

896, for antennas having rods or wire forming a cage or a hollow post.

805 This subclass is indented under subclass 793. Subject matter wherein the two active conductive masses are elongated and are supported adjacent the lead-in terminals by structure permitting relative angular movement with respect to one another, as by a pivot or hinge, for such purposes as folding or electrically adjusting the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

880+, for antennas in general with adjustable or collapsible supports.

915, for collapsible, foldable or adjustable reflectors or directors.

806 This subclass is indented under subclass 793. Subject matter wherein each of the separate conductive masses constitutes a rod having a bend or curve therein remote from the lead-in terminal to constitute a change in direction of the rod, and all portions on both sides of the bend being radiators or collectors of radio wave energy.

(1) Note. Subject matter involving a mere loop in the conductive mass where the direction of the active radiating or collecting member resumes its original direction in a straight line and where such loop is itself not an active part of the radiating member, but serves, for example, merely as a phasing or loading means is not classified in this subclass but in such subclasses as 801 and 802.

SEE OR SEARCH THIS CLASS, SUBCLASS:

733, and 736, for traveling wave type antennas in the form of a rhombus and inverted V, respectively.

803+, for folded doublet type antennas.

899, for antennas with area increasing means such as spiniferous.

807 This subclass is indented under subclass 793. Subject matter wherein each mass constitutes an elongated portion which is tapered, or significantly thickened or enlarged over at least a portion of its length, such as a thick elongated rod, cylinder, or cone, for impedance matching, broadbanding, or presenting a larger area for wave energy radiation or collection.

(1) Note. The elongated portion may be a single rod, or a plurality of rods or wires forming substantially a single conductive mass and enclosing a volume, as opposed to the sheet or screen type mass of subclass 795, which defines a plane. Such wires or rods for classification in subclass 807, would have the ends remote from the feed points electrically connected, as by a conductive loop, or being joined at a common point, as opposed to subclass 808 wherein the diverging rods are electrically free at their outer ends.

SEE OR SEARCH THIS CLASS, SUBCLASS:

790+, for sleeve type antennas.

795, for sheet or screen type doublet antennas. See also (1) Note, above.

808, for doublets wherein the plural rods form a V. See also (1) Note, above.

831, for stub type fractional, full wave, or multiple wave linear type antennas.

874+, for mast or tower type antennas.

895, for spiral or helical type antennas.

896+, for antennas wherein rods or wires form a cage or hollow post.

897, for mesh, woven, braided or multiple strip type antennas.
898, for hollow metallic body type antennas.
899, for antennas having area increasing means, e.g., spiniferous or metal ball on top.

808 This subclass is indented under subclass 793. Subject matter wherein each conductive mass is composed of a plurality of straight linear rods which diverge from and are electrically connected at a common point.

(1) Note. In this subclass the diverging rods of each conductive mass are electrically free at their outer ends, as distinguished from subclass 795 above wherein the diverging rods are electrically connected together at their ends.

SEE OR SEARCH THIS CLASS, SUBCLASS:
794, for antennas wherein the plural rod arms form a V and the sides of each V are significantly different.
795, for sheet or wing type doublet antennas.
797+, for plural doublets which cross at their mid-points.
807, for doublet antennas having tapered, thick, or enlarged arms.

809 This subclass is indented under subclass 793. Subject matter wherein the conductive masses are straight and linear, and which are angularly disposed to form a V.

SEE OR SEARCH THIS CLASS, SUBCLASS:
735, for balanced V traveling wave type antennas.
805, for doublet antennas whose arms are angularly adjustable.
808, for doublet antennas wherein each doublet arm has plural rods formed as a V.

810 This subclass is indented under subclass 793. Subject matter including two or more separate and independent doublets as therein defined.

(1) Note. For classification herein the doublets must have their respective arms physically distinct and separate. A two arm doublet even when connected to two sources or loads at different frequencies, and which radiates at both frequencies efficiently is not sufficient for classification herein, but would normally be classified as a single doublet in such subclasses as 818+, 820+ and 823+, below. Further the doublets must have their respective arms independently connected to the source or load. When the arms of one doublet are connected to the source or load through the arms of the other doublet as a current conducting medium, classification is not here but in subclass 801, where the three or more arms of the respective doublets are collinear.

SEE OR SEARCH THIS CLASS, SUBCLASS:
726, and 727, for plural separate diverse type antennas including a balanced doublet.
730, for plural diverse antennas using the same element including a balanced doublet.
741, for high frequency type loops formed by a plurality of balanced doublets.
794, for diverse type doublets.
796, for helically or angularly staggered plural dipoles.
797+, for plural crossed balanced doublets.
799+, for plural circumferentially arranged doublets.
801, for doublets formed by three or more collinear units.
824, for planar arrays of linear antennas.
826+, for plural linear type antennas having an appreciable wave length dimension.
844, for plural antennas spaced a fractional or full wave length apart.
879, for supports for plural separate antennas.
893, and the Search Notes thereunder, for plural antennas in general.

811 This subclass is indented under subclass 810. Subject matter wherein the respective arms of the doublets are connected by two straight parallel closely spaced nonradiating or noncollecting feed lines, the signal source or load being connected at one end of these lines together

with structure substantially eliminating standing waves on these lines, as by terminating the end of the lines opposite the signal source or load in a resistance equal to the characteristic impedance of the lines.

SEE OR SEARCH THIS CLASS, SUBCLASS:

731+, for traveling wave type antennas generally.

739, for antennas with a terminating resistance at the open end.

770, for plural slot type antennas.

826+, for plural fractional, multiple or full wave linear type antennas.

899, for antennas with area increasing means, which may be spiniferous.

812 This subclass is indented under subclass 810. Subject matter wherein each arm of one doublet is physically parallel to each arm of another doublet, the arms of these doublets being substantially straight and linear.

SEE OR SEARCH THIS CLASS, SUBCLASS:

799+, for circumferentially arranged doublets which may have parallel arms

811, for fishbone type arrays.

813 This subclass is indented under subclass 812. Subject matter wherein in addition to the parallel arranged doublets, a further doublet is provided, whose two arms together with the two arms of one of the parallel arranged doublets lie along a single straight line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

790+, for sleeve type antennas wherein a plurality of radiating sleeves may surround a feed line.

801, for single doublets formed of three or more collinear units.

827, for plural collinearly arranged fractional, multiple or full wave linear type antennas.

814 This subclass is indented under subclass 812. Subject matter including a passive network (which may be resistive, inductive or capacitive or any combination thereof) for transmitting signal energy between the doublets and a source or a receiver of such signal energy.

(1) Note. For an explanation of the terms used in the above definition and distinctions between coupling and tuning subclasses, see (1) to (4) Notes under subclass 850, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

811, for fishbone type arrays of doublet antennas.

813, for parallelly and collinearly arranged doublet antennas with coupling networks.

816, for plural doublet antennas generally with coupling networks.

820+, for single doublet antennas with coupling networks.

852, for plural antennas in general with impedance matching networks.

853+, for plural antennas in general with coupling networks.

815 This subclass is indented under subclass 812. Subject matter wherein the doublets are combined with conductive structure (usually metallic, e.g., rod) which reradiates into free space impinging radio waves coming from or going to the antennas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

813, for parallelly and collinearly arranged antennas with a parasitic element.

818+, for single doublets with parasitic elements. See also the Search Notes, thereunder.

816 This subclass is indented under subclass 810. Subject matter including a passive network (which may be resistive, inductive, or capacitive or any combination thereof) for transmitting signal energy between the doublets and a source or a receiver of such signal energy.

(1) Note. For an explanation of the terms used in the above definition and distinctions between coupling and tuning subclasses, see (1) to (4) Notes under subclass 850, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

726, 727 and 730, for plural diverse type antennas including a balanced doublet, which may include a coupling network.

814, for plural parallel balanced doublets with a coupling network.

820+, for single doublet antennas with coupling networks.

852, for plural antennas in general with impedance matching networks.

853, for plural antennas in general with coupling networks.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 100+ for branched circuits involved in wave transmission networks.

817 This subclass is indented under subclass 810. Subject matter wherein the plural antennas are combined with conductive structure which reradiates into free space impinging radio waves coming from or going to the active antennas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

813, and 815, for plural parallel balanced doublets with a parasitic element.

818+, for single balanced doublets with a parasitic element.

818 This subclass is indented under subclass 793. Subject matter wherein the two active conductive masses are combined with conductive (usually metallic) structure (e.g., a rod) which reradiates into free space impinging radio waves coming from or going to the antenna, the velocity of the reradiated wave having a component which is in the same direction (director) as, or in the opposite direction (reflector) to, that of the velocity of the impinging wave.

SEE OR SEARCH THIS CLASS, SUBCLASS:

761, for reflector and antenna relatively movable, together with means for effecting such motion for scanning, sweeping or orienting.

813, and 815, for plural parallel balanced doublets with parasitic elements.

817, for plural balanced doublets generally with parasitic elements.

832, for subject matter including an active antenna which also acts as a reflector.

833, for antennas in general with parasitic directors.

834+, and the Search Notes thereunder, for antennas in general with parasitic reflectors.

878+, for reflectors or directors generally with supports therefor.

912+, for reflectors or directors, per se.

819 This subclass is indented under subclass 818. Subject matter including both a director and reflector as defined in the above subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

833, for antennas in general having parasitic directors and reflectors.

820 This subclass is indented under subclass 793. Subject matter wherein the doublet antenna is combined with a passive network (which may be resistive, inductive or capacitive or any combination thereof) for transmitting signal energy between the doublet and a source or receiver of such signal energy.

(1) Note. For an explanation of the terms used in the above definition and distinctions between coupling and tuning subclasses, see (1) to (4) Notes under subclass 850 below. For more comprehensive search notes to other classes see those under subclass 850, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

722, for antennas having lumped reactance filters between active antenna sections.

730, for plural diverse type antennas one of which is a doublet having a common active radiating or collecting portion with the other being usually coupling having both balanced and unbalanced sections to pass high and low frequency currents according to the operation in question of the antenna as a doublet or other antenna respectively.

745+, for antennas with variable reactance for tuning.
749+, for antennas having lumped reactance for loading.
814, and 816, for plural doublets with coupling networks.
850+, for antennas with coupling networks in general. See also (1) Note, above.

SEE OR SEARCH CLASS:
333, Wave Transmission Lines and Networks, particularly subclasses 1+ and 24+, for wave transmission coupling networks in general.

821 This subclass is indented under subclass 820. Subject matter wherein the passive coupling network includes four terminals, one pair of which are connected to the balanced doublet and the other pair being for connection to a source or receiver of signal energy or a circuit network leading thereto; the impedance across the pair of terminals connected to the balanced doublet being symmetrical and the network impedance across the other pair of terminals being asymmetrical with respect to a given potential plane (e.g., ground), this latter impedance being effective to convert symmetrical potential applied at the symmetrical pair of terminals (for connection to the balanced doublet) to asymmetrical potential applied at the other pair of terminals or vice versa.

SEE OR SEARCH THIS CLASS, SUBCLASS:
859, for antennas generally with balanced to unbalanced coupling networks.

SEE OR SEARCH CLASS:
333, Wave Transmission Lines and Networks, subclasses 25+ for wave transmission lines and networks with balanced to unbalanced circuits.

822 This subclass is indented under subclass 820. Subject matter wherein the passive coupling network includes one or more impedance elements constructed or proportioned to substantially eliminate the reflected wave energy between the doublet antenna and the receiver or signal energy source, caused by impedance differences.

SEE OR SEARCH THIS CLASS, SUBCLASS:
731+, 739+ and 811, for antennas with means to eliminate reflection therein or in the coupling circuits.
821, for impedance matching coupling circuits combined with balanced to unbalanced circuits and balanced doublets.
852, and 860+, for antennas in general combined with impedance matching networks.

SEE OR SEARCH CLASS:
333, Wave Transmission Lines and Networks, subclasses 32+ and 124+ for wave transmission lines and networks involving impedance matching or impedance matching networks.

823 This subclass is indented under subclass 793. Subject matter wherein the overall physical length of the two active conducting masses is adjustable, as by the length of at least one of the masses being adjustable or by the relative spacing of the masses being adjustable, for such purposes as tuning or collapsing the doublet.

SEE OR SEARCH THIS CLASS, SUBCLASS:
723, for single resonant end-fed linear type antennas adjustable in length for tuning.
880+, for antennas with adjustable or collapsible supports.
889, for rod-like antennas retractable into a support.
901+, and the Search Notes thereunder, for telescoping rod type antennas.

824 This subclass is indented under subclass 700. Subject matter wherein a plurality of physically separate straight linear radiating type conductors lie in a planar unique surface; or the claims recite that the linear conductors are arranged in a plane, or equivalent subject matter.

(1) Note. The linear conductors are considered separate when they are isolated in space or nonradiating or noncollecting means couple the linear portions.

(2) Note. Two parallel linear conductors are not sufficient for classification here, but rather in subclasses 826+, 844 and 893 below since other surfaces such as a cylinder may be passed through these conductors. At least three parallel linear conductors are necessary for classification here, or else the claims must recite that the antennas lie in a plane.

SEE OR SEARCH THIS CLASS, SUBCLASS:

797+, 799+ and 810, for balanced doublet type antennas which may lie in a plane.
826+, for plural fractional, multiple, or full wave linear type antennas.
835+, for plural active antennas with a reflector.
844, for plural antennas spaced a fractional or full wave length apart.
853+, for plural antennas with a coupling network or impedance in the leadin.
893, and the Search Notes thereunder, for plural antennas in general.

SEE OR SEARCH CLASS:

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 for directive communication systems which may include an antenna array.

825 This subclass is indented under subclass 700. Subject matter wherein the antenna is a straight linear conductor such as a rod, wire or stub and wherein the claims recite a particular length, series of length, range of length, or limit of length of this conductor in terms of its operating wave length, or the claims recite a physical length in numerical terms (e.g., number of feet) and in the latter case the context of the disclosure establishes that such terms are an appreciable part of the operating wave length.

(1) Note. This and the indented subclasses are limited to straight linear antennas or to a plurality of such antennas dimensioned as recited in the definition above. Antennas in general (i.e., having a shape other than straight linear) having an appreciable wave length dimension are classified in subclass 843, below.

(2) Note. A lattice type mast of appreciable electrical length which functions as a single elongated conductor, is classified here. Otherwise classification is in subclasses 874+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

723, for single electrically long antennas whose length is adjustable for tuning.
731+, for traveling wave type antennas.
741+, for high frequency type loops.
745+, for antennas with variable reactance for tuning, this reactance being in addition to any inherent distributed reactance of the antennas.
749+, for antennas with lumped reactance for loading.
767+, for slot type antennas.
790+, for sleeve type antennas.
793+, for balanced doublet type antennas.
824, for planar type high frequency arrays.
843, for antennas in general having an appreciable wave length dimension. See also (1) Note, above.
874+, for mast or tower type antennas. See also (2) Note, above.
900+, for rod type antennas of no appreciable wave length.

826 This subclass is indented under subclass 825. Subject matter including a plurality of physically separate linear, radiating type conductors, at least one of the conductors having a length as recited in subclass 825.

(1) Note. A first linear conductor with a second such conductor extending therefrom as a branch is not within the above definition, since the conductors are not separate as the definition requires. See subclass 843 for such subject matter if an appreciable wave length dimension is recited.

(2) Note. The linear conductors are considered separate when they are isolated in space, or when nonradiating means or noncollecting means couple the linear conductors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

731+, and particularly subclass 737 for traveling wave type antennas involving a plurality of linear antennas of an appreciable electrical length.

739+, for antennas with a terminating resistance, which may involve a plurality of linear sections of appreciable wave length dimensions.

741+, for high frequency loop type antennas, which may involve a plurality of linear type sections of appreciable wave length dimensions.

790+, for sleeve type antennas, which may involve a plurality of linear sections.

793+, for center-fed doublet type antennas.

824, for planar type high frequency arrays.

843, for antennas in general having an appreciable wave length dimension.

844, for plural antennas spaced a fractional or full wave length apart.

893, and the Search Notes thereunder, for plural antennas in general.

827 This subclass is indented under subclass 826. Subject matter wherein the linear conductors have their longitudinal axes lying substantially on a common straight line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

749+, for antennas with lumped reactance for loading, wherein the reactance may separate collinearly arranged active sections.

790+, for sleeve type antennas, wherein a plurality of active sleeves may be arranged collinearly along a feed line.

801, for balanced doublets formed by three or more collinear units.

813, for parallel and collinear separate doublets.

828, for linear antennas with a nonuniformity therein generally.

875, for sectional mast or tower type antennas.

828 This subclass is indented under subclass 825. Subject matter wherein the linear antenna has an abrupt change in its cross-sectional dimension or has a substantially nonradiating branch.

(1) Note. Usually such changes in dimensions or branches have a reactive effect which effects a change in the loading of the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

749+, for antennas having lumped reactance for loading.

790+, for sleeve type antennas.

802, for balanced doublets with distributed reactance added to the doublet arms.

827, for plural section antennas collinearly arranged in which the sections are separated by nonuniformities, which may be in the form of nonradiating or noncollecting reactive loops in the antenna conductor.

843, for antennas in general having an appreciable wave length dimension, which may include branches or abrupt changes in cross-sectional dimension.

899+, for antennas having area increasing means (e.g., changes in antenna dimensions or branches).

829 This subclass is indented under subclass 825. Subject matter together with structure including ground or structure most closely associated with or simulating ground, and such structure being connected to the terminal of the signal receiver or source opposing the active antenna terminal (i.e., having the signal receiver or source interposed between the active antenna and this structure), for establishing a reference potential level for operating the active antenna.

(1) Note. Antennas designated as ground plane, steering wheel, drooping ground plane, skirt or cone, and flat circular ground plane antennas are typical of the patents classified in this and the indented subclass, it being understood that the length of the active antenna must be set forth as specified in the definition of subclass 825, above. Sometimes structure identical with grounding structure defined in this subclass is designated merely as a shield decoupling the antenna from its transmission line, and is classified herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

834+, for antennas with parasitic reflectors.
841+, for antennas with electrical shields.
846+, for antennas in general with grounding structure including counterpoises.
905, for antennas combined with a transmission line including shields.

830 This subclass is indented under subclass 829. Subject matter including a coaxial feed line, the active antenna being connected to the inner conductor at the end of this line and the grounding structure being connected to the outer conductor at the end of this line.

SEE OR SEARCH THIS CLASS, SUBCLASS:

790+, for antennas wherein an active sleeve surrounds the feed line.

831 This subclass is indented under subclass 825. Subject matter wherein the linear conductor is thickened or enlarged in cross section to produce such shapes as cylindrical, conical, diamond, double diamond, and spheroidal.

(1) Note. Usually the antennas are a quarter wave length long; and the thickening or enlarging is for the purpose of obtaining a wide band characteristic over a frequency range, any resulting physical strengthening or streamlining of the antennas being incidental.

SEE OR SEARCH THIS CLASS, SUBCLASS:

790, for sleeve type antennas.
807, for dipoles having a stub configuration.
826+, for plural stub type antennas.
829+, for stub antennas with grounding structure, including counterpoises.

832 This subclass is indented under subclass 700. Subject matter wherein the claimed subject matter includes an active antenna designated as a reflector, or includes an energized or active reflector (i.e., coupled to a signal source or to a receiver).

(1) Note. The patents classified in this subclass usually include a plurality of active antennas which are connected to a single transmitter or receiver, and have a significant wave length spacing. The subject matter appears very similar to so-called "end fire arrays". However, in this subclass the rear active antenna (i.e., in the direction opposed to the direction of radiation of the array) is designated in the claim as being a reflector.

833 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with conductive (usually metallic) structure, (e.g., a rod) which reradiates into free space impinging radio waves coming from or going to the active antenna, the velocity of the reradiated wave having a component in the direction of velocity of the impinging wave, thereby to modify the radiation pattern of the active antenna, there being no significant potential relationship between the active antenna and the conductive structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

781+, for wave guide type antennas with external directors.
815, 817 and 818, for dipole antennas with parasitic elements which may be directors; and subclass 819 for dipole antennas having both reflectors and directors.
834+, for antennas with reflectors.
912+, for reflectors and directors, per se.

834 This subclass is indented under subclass 700. Subject matter wherein an active antenna is combined with conductive structure (usually metallic, e.g., screen rod or plate) which returns or reradiates back into free space impinging radio waves coming from or going to the active antenna, the velocity of the returned wave having a component in a direction opposite to the direction of velocity of the impinging wave, thereby to modify the radiation pattern of the active antenna, there being no significant potential relationship between the active antenna and the conductive structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

755, for antennas with spaced radio wave lens or diffractor with a reflector; for

waveguide-type antennas with reflectors.

757+, for directive antennas with means for moving the antennas for scanning, sweeping or orienting, which may include reflectors; and particularly indented subclass 761 for a reflector and antenna relatively movable.

779, 780, and 781+, for waveguide-type antennas with reflectors.

815, 817 and 818+, for balanced doublet antennas with reflectors.

829+, for fractional, multiple, or full wave linear type antennas with grounding structure.

832, where the reflector is also an active antenna.

833, for antennas with a director.

841+, for antennas with electrical shields.

846+, for antennas with grounding structure including counterpoises.

878+, for antenna and/or reflector with supports.

912+, for reflectors or directors, per se, and see also the search notes under subclass 912.

835 This subclass is indented under subclass 834. Subject matter including two or more active antennas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

779, for plural wave guide antennas with a reflector.

815, and 817, for plural balanced doublets with a reflector.

832, for antenna systems wherein an active antenna acts as a reflector.

893, and Search Notes thereunder, for plural antennas.

836 This subclass is indented under subclass 835. Subject matter including two or more reflectors as defined in subclass 834.

SEE OR SEARCH THIS CLASS, SUBCLASS:

837+, for plural reflectors with a single active antenna.

837 This subclass is indented under subclass 834. Subject matter including two or more reflectors as defined in subclass 834 above.

(1) Note. When a plurality of reflectors are physically combined to constitute a unitary reflector, such as the grid type, such a reflector is considered a single reflector. Plural reflectors usually occur when successive reflection occurs, or when reflectors of different type are combined.

SEE OR SEARCH THIS CLASS, SUBCLASS:

836, for plural reflectors with plural active antennas.

838 This subclass is indented under subclass 837. Subject matter wherein a first reflector is positioned behind an active antenna and a second reflector (screen reflector) is positioned in front of the antenna, the second reflector redirecting diverging rays emanating from the active antenna in transmission, and shielding the active antenna in reception from undesired energy when coming from a direction other than that of the desired received energy.

(1) Note. Usually the subject matter in this subclass includes a parabolic reflector with a transmitting active antenna at its focus and a screening reflector on the side of the transmitting antennas opposite from the parabolic reflector. The screening reflector directs the diverging energy radiated from the source towards the parabolic reflector, which redirects this energy in a parallel path.

(2) Note. The second reflector (screen reflector) referred to in the definition above is not a director. See subclass 833 above for antennas with directors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

840, for active antennas with parabolic reflectors.

841+, for antennas with shields.

839 This subclass is indented under subclass 834. Subject matter wherein means are provided permitting relative movement or adjustment between the reflector or a part thereof and the active antenna or a part thereof under operative conditions.

(1) Note. Where means is provided for moving the active antenna and reflector relative to each other, as a handle, motor, gearing or other means for transmitting motion, to change the directive pattern of the antenna for scanning, sweeping or orienting in addition to the means permitting such motion, classification is not here but in subclass 761, above. However, where means are provided for moving the active antenna relative to the reflector, in addition to mere means permitting such motion, for purposes other than those recited in subclass 761, classification is in this subclass (839) as opposed to subclass 761.

(2) Note. Where an antenna and reflector are claimed with means to fold or collapse either or both when not in operation, classification is not herein but in subclass 834, above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

361, for directive antennas having a reflector together with means for moving the active antenna and reflector relative to one another for scanning, sweeping or orienting. See also (1) Note, above.

880+, for antennas or reflectors with adjustable or collapsible supports, and particularly subclass 882 for antennas or reflectors with a pivoted or rotatable support for the antenna or reflector.

915, for reflectors, per se, which are collapsible, foldable or adjustable.

840 This subclass is indented under subclass 834. Subject matter wherein the reflector presents a reflecting surface having a parabolic contour in at least one plane, and the active antenna is positioned at the focus of the parabola.

(1) Note. The reflector may be a sheet, screen, or group of rods, provided the parabolic contour is present. It may include reflecting portions which are not parabolic.

SEE OR SEARCH THIS CLASS, SUBCLASS:

775, 779 and 781+, for wave guide type antennas with a reflector in which the reflector may be of the parabolic type.

815, 817 and 818+, for center-fed balanced doublet type antennas with a reflector in which the reflector may be of the parabolic type.

841 This subclass is indented under subclass 700. Subject matter wherein a conductive or low reluctance structure, such as a wire, plate, or grid, is combined with the antenna to reduce, as by dissipation through a resistance or by conduction to ground, undesired radiation, or electric or magnetic fields, which are directed toward the antenna from an external source, or which emanate from the antenna.

(1) Note. While a shield may modify the radiation of an antenna as does the reflector, in the case of the shield the energy is essentially absorbed rather than returned to space. Likewise in the case of the ground, as in subclass 846 below, the reflecting function may also be performed.

(2) Note. For classification in this subclass, the shield must cooperate with the antenna in its operative position. A mere sheath for an antenna when not in use is not classified in this subclass, but in subclasses 872 and 889.

SEE OR SEARCH THIS CLASS, SUBCLASS:

702, for antennas combined with radio cabinets which may include shielding.

705+, 709+ and 711+, for antennas with aircraft, watercraft and vehicle structure respectively, where the antennas may be shielded by such structure.

719, for antennas buried underground or submerged under water.

829, for fractional, multiple or full wave linear type antennas with a decoupling shield.

851, for antennas with a coupling network or impedance in the leadin, together with a shield for such network or impedance.

872, for antennas with a housing or protective covering.
905, for antennas combined with shielded transmission lines.
906, for antennas combined with shielded electrical connectors.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 350 through 397 for shielded or screened electrical conductors and insulators.
307, Electrical Transmission or Interconnection Systems, subclass 91 for electrical transmission systems with shielding means, generally.
455, Telecommunications, subclass 271 and 283+ for radiation prevention and noise elimination in the antenna circuits of radio receivers.

842 This subclass is indented under subclass 841. Subject matter wherein the antenna is of the loop type as defined in subclass 866, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
741+, for high frequency type loop antennas which may involve shields.
866+, for loop type antennas, per se.

SEE OR SEARCH CLASS:
336, Inductor Devices, particularly subclasses 84+ and the search notes thereunder for shielded electrical inductor devices.

843 This subclass is indented under subclass 700. Subject matter wherein the claims recite the active antenna or portion, section, or part thereof as having a dimension which is a fractional part or multiple (including unity) of the operating wave length of the antenna.

(1) Note. Subject matter involving spiral, helical and sinuous types of antennas, where such antennas are claimed to have a particular operating wave length dimension, are classified herein. An example of such subject matter is a helix having a pitch or circumference which is an appreciable portion of a wave length. This is the residual subclass for antennas having a particular wave length dimension. Special types of antennas, which may also involve a particular operating wave length for the active antenna, are classified with their particular type of antenna, as for example, subclasses 772+ for wave guide type antennas, subclasses 793+ for balanced doublets, and subclasses 825+ for linear type antennas of a particular electrical length.

SEE OR SEARCH THIS CLASS, SUBCLASS:
723, for single linear antennas having an adjustable length for tuning.
741+, for high frequency loops having an appreciable wave length dimension.
749+, for antennas of a particular wave length dimension with lumped reactance for loading.
772+, for wave guide type antennas which may have an appreciable wave length dimension.
793+, for balanced doublets having an appreciable wave length dimension.
825+, for fractional, multiple or full wave linear type antennas.

844 This subclass is indented under subclass 700. Subject matter including a plurality of antennas spaced a physical distance apart, which distance is an appreciable part of a wave length or number of wave lengths at the operating frequency of the antennas; or including a plurality of antennas combined with structure which of necessity results in the antennas being spaced a physical distance apart, which distance is an appreciable part of a wave length or number of wave lengths at the operating frequency of the antennas.

(1) Note. For classification in this subclass the claims must either recite the antennas being spaced a particular part of a wave length or number of wave lengths at the operating frequency; or spaced a particular distance, which from the specification would establish the spacing of the antennas as a particular part of a wave length or number of wave lengths at the operating frequency; or the antennas being connected, supported or separated by structure which establishes a particular wave length spacing of the antennas.

(2) Note. Patents claiming a plurality of antennas connected by fractional or multiple wave length transmission lines or other structures which would constitute electrical coupling are not classified in this subclass unless they also claim the physical spacing of the antennas, but are found in subclasses 852 and 853+.

(3) Note. A mere recitation of the relationship between the spacings of respective antennas of an array (e.g., increasing distances or unequal distances between antennas) is not sufficient for classification in this subclass. For classification here, the particular spacing in operating wave length between two antennas is necessary.

SEE OR SEARCH THIS CLASS, SUBCLASS:

725+, for plural separate diverse type antennas, which may be spaced a particular wave length apart.

770+, for plural slot type antennas, whose slots may be spaced a particular wave length apart.

776+, for plural wave guide type antennas, which may be spaced a particular wave length apart.

794, 796, 797+, 799+, and 810+, for balanced doublet antennas which may be spaced a particular wave length apart.

824, for planar type high frequency arrays.

826+, for plural fractional, multiple, or full wave linear antennas, which may be spaced a particular wave length apart.

835, for plural active antennas with reflectors.

852, and 853+, for plural antennas with a coupling network or impedance in the leadin. See also (2) Note, above.

867, for plural loop antennas.

879, for plural separate antennas with a support.

893, for plural antennas, including those of no particular type, and having no particular spacing or coupling. Antennas in particular patterns or arrangements are classified here. See also the Search Notes to this subclass.

SEE OR SEARCH CLASS:

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 for directive signaling systems which may involve plural antennas spaced a particular wavelength apart.

845 This subclass is indented under subclass 700. Subject matter wherein the antenna has a connection to ground at some point on the antenna physically or electrically spaced on the antenna from the point of connection of the transmitter or receiver leadin to the antenna.

(1) Note. This ground connection is in addition to any ground or reference potential which the transmitter or receiver leadin may provide.

SEE OR SEARCH THIS CLASS, SUBCLASS:

731+, for antennas with energy absorbing means remote from the feed line coupling, which means may be connected to ground.

739, for antennas connected to ground through a resistance at the end electrically remote from the lead-in terminals.

846+, for antennas with grounding structure in general.

846 This subclass is indented under subclass 700. Subject matter wherein the active antenna is combined with structure including ground or structure most closely associated with or simulating ground, and such structure being connected to the terminal of the signal receiver or source opposing the active antenna terminal (i.e., having the signal receiver or source interposed between the active antenna and this structure), for establishing a reference potential level for operating the active antenna.

(1) Note. For classification herein significant details of the ground structure must be claimed. The mere recitation of a ground or ground terminal or of a switch to connect to ground is not sufficient to bring such subject matter within this subclass.

(2) Note. The ground structures may radiate signal energy by reflection, as for example, where such a structure functions as an image antenna. But as distinct from reflectors in subclasses 834+ and 912+ the ground structure bears a significant potential relationship with the antenna, while a reflector has no such significant potential relationship.

(3) Note. This grounding structure is usually used with unbalanced or capacity antennas, as opposed to balanced antennas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

705+, 709+ and 711+, for antennas with aircraft, watercraft and vehicles, respectively, wherein these latter structures may constitute a ground or counterpoise.

719, for underground or underwater antennas.

829+, for fractional, multiple or full wave linear antennas with grounding structure, including counterpoises.

834+, and 912+, for antennas with reflectors and reflectors, per se. See also (2) Note, above.

841+, for antennas with an electrical shield.

845, for antennas with a ground connection spaced from the feed line connection.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 6+ for earth grounds for conductors.

847 This subclass is indented under subclass 846. Subject matter wherein the structure most closely associated with ground is insulated from or capacitively coupled to the natural ground to aid in the function of the natural ground, particularly where variations or limitations of the characteristics of the natural ground interfere with its proper function.

(1) Note. Antenna counterpoises, which are insulated or capacitively coupled to ground, are classified herein.

848 This subclass is indented under subclass 846. Subject matter wherein the grounding structure for the antenna includes conductive structure used in place of the earth and which grounding structure is distinct from the earth.

SEE OR SEARCH THIS CLASS, SUBCLASS:

705+, and 709+, for antennas combined with devices suspended in air or water, respectively, in which the device may serve in whole or in part as an artificial ground.

711+, for antennas combined with vehicles wherein the vehicle may form or is part of an artificial ground.

829+, for multiple, fractional, or full wave linear type antennas with a ground plane.

849 This subclass is indented under subclass 846. Subject matter wherein the natural earth ground is modified by the addition of structure or material in direct contact with or within the earth to modify or maintain the radiation reflecting or absorbing characteristics or electrical conducting properties of the natural ground.

SEE OR SEARCH THIS CLASS, SUBCLASS:

719, for underground or underwater type antennas.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 6+ for earth grounds for conductors.

850 This subclass is indented under subclass 700. Subject matter wherein an active antenna is combined with a passive network (which may be resistive, inductive, or capacitive or any combination thereof) for transmitting the signal energy between the active antenna and a source or receiver of such signal energy.

(1) Note. Where the impedance network is located at the junction of the leadin and the antenna and the function of such impedance is loading or tuning the natural frequency of the antenna, classification is in subclasses 745+ or 749+.

However, where the network is so located and the function is coupling, and there is no loading or tuning of the natural resonant frequency of the antenna classification is in this subclasses (850+) as opposed to subclasses 745+ or 749+. See subclasses 745+ and 749+ and the Notes thereto for definitions of antennas with tuning and loading, respectively.

(2) Note. Mere recitation of a transmission line or lead-in wire joining the antenna to its signal source or load without any significant electrical characteristics is not sufficient for classification here. Such subject matter, including structural characteristics of the transmission line, is classified in subclass 905, below.

(3) Note. The combination of a coupling network as defined above with an antenna network recited by name only is sufficient for classification in this subclass as opposed to Class 333, Wave Transmission Lines and Networks, where coupling networks, per se, as there defined are classified.

(4) Note. Combinations of an antenna, coupling network, and a receiver or transmitter are classified in this and indented subclasses, unless an active element or network, or significant structure of a transmitter or receiver is claimed. For definitions of active element or significant structure see (3) Note under subclass 858, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

722, for antennas having filters in the active antenna.

731+, and 739+, for antennas having energy absorbing means remote from the feed line coupling or having feed back coupling.

745+, for antennas with variable reactance for tuning. See also (1) Note, above.

749+, for antennas having lumped inductance or capacity for loading. See also (1) Note, above.

771, for plural slot type antennas with wave guide coupling.

814, 816 and 820, for balanced doublets having a coupling network or impedance in the leadin.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, pertinent subclasses, for miscellaneous electrical transmission or interconnection systems.

323, Electricity: Power Supply or Regulation Systems, pertinent subclasses, for voltage magnitude and phase control systems.

333, Wave Transmission Lines and Networks, subclasses 1+ for plural channel systems involving coupling networks, and subclasses 24+ for coupling networks, per se.

851 This subclass is indented under subclass 850. Subject matter wherein the coupling network, or the leadin associated with the coupling network includes structure or is arranged for minimizing undesired radiation effects to or from the coupling network or the leadin.

(1) Note. Where the corrective, radiation suppression means includes significant elements of a transmitter or receiver, or involves circuit connections to such elements other than the antenna and coupling and/or the transmission line thereto, classification is in Class 455, subclasses 114, 271 and 283+ for the transmitter and receiver respectively.

(2) Note. Where shielding is directly associated with the active antenna to modify its radiation or reception classification is not here, but in subclass 841. Where the shielding or other radiation suppressing means is associated with a transmission line or electrical connector, classification is in subclasses 905 and 906, respectively.

(3) Note. A mere filter in the coupling network which discriminates against the passage of electrical energy through the coupling network, although such energy causes or may be caused by undesired radiation, is not classified in this sub-

class, but in subclass 850 and other indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

782, for wave guide type antennas with means reducing reradiaton into the active antenna.

789, for antennas located within conductive apertured housings or walls.

790+, for antennas wherein an active sleeve surrounds the feed line.

829+, for antennas of significant electrical length with decoupling shields.

841, for antennas with shields for such antennas. See (2) Note, above.

905, for antennas combined with transmission lines which may involve the suppression of radiation interference to or from such lines. See (2) Note, above.

906, for antennas combined with electrical connectors which may involve the suppression of radiation interference to or from such electrical connectors. See (2) Note, above.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 32+ and 50+ for anti-inductive structures including shielding means.

307, Electrical Transmission or Interconnection Systems, subclasses 89+ for miscellaneous electrical systems having anti-induction means or means to prevent undesired coupling to other systems.

315, Electric Lamp and Discharge Devices: Systems, subclass 85 for electric lamp and discharge device systems with electromagnetic wave radiation preventing or shielding means.

333, Wave Transmission Lines and Networks, subclass 12 for wave transmission systems having transmission line inductive or radiation interference reduction means.

336, Inductor Devices, subclasses 84+ for inductor devices with electric and/or magnetic shielding means.

455, Telecommunications, subclass 271, for coupling of an antenna to a detector, mixer, or amplifier in a radio receiver for minimizing radiation effects.

852 This subclass is indented under subclass 850. Subject matter including a plurality of interrelated signal paths of which the passive coupling network is at least a part, and wherein the circuit elements of this arrangement are positioned and proportioned to reduce wave reflections arising from the interrelation of the signal paths.

(1) Note. Most of the patents in this subclass disclose a branched coupling network and an antenna joined by the coupling network to a plurality of transmitters or receivers, or a branched coupling network and a plurality of antennas joined to a transmitter or receiver. The branched coupling networks present impedances at the junction to substantially eliminate the reflected wave energy caused by the junction, or one or more impedance elements are provided which are constructed or proportioned to substantially eliminate the reflected wave energy caused by the branched circuit coupling network. See (1) Note under subclass 858 for classification of radiant energy systems involving duplexing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

776+, for wave guide type antennas with branched feed guide or line which may involve impedance matching.

814, and 816, for plural balanced doublet antennas with coupling which may involve impedance matching.

822, for balanced doublet antennas with impedance matching.

860+, for antennas coupled by a single path to a source or load involving impedance matching.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 1+, and particularly subclasses 124+, for plural channel wave transmission systems involving impedance matching; and subclasses 32+ for single channel cou-

pling networks involving impedance matching.

853 This subclass is indented under subclass 850. Subject matter including a plurality of antennas and a passive coupling network or a combination of such networks, the antennas being directly connected to such network or networks.

SEE OR SEARCH THIS CLASS, SUBCLASS:

100+, for directive, radiant energy signaling systems, which may involve plural antennas with coupling.

776+, for plural wave guide type antennas which may involve coupling.

814, and 816, for plural doublet type antennas with coupling.

852, for plural antennas with coupling networks, which also involve impedance matching.

893, and the Search Notes thereunder for plural antennas generally which may involve coupling networks.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 1+ for plural channel wave transmission systems which may be coupled to plural antennas. See also the search notes thereunder.

855 This subclass is indented under subclass 853. Subject matter wherein the antennas are of the loop type as defined in subclass 866, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

726, and 728, for plural diverse type antennas involving a loop antenna.

742, for plural high frequency loop type antennas which may involve coupling.

867, for plural loop type antennas.

856 This subclass is indented under subclass 850. Subject matter wherein the active antenna forms the secondary or primary winding of a transformer magnetically coupled from a primary or to a secondary winding for connecting from or to a signal source or receiver, respectively.

(1) Note. A mere transformer winding in series with the antenna is not sufficient for such subject matter to be classified herein. The portion of the antenna which directly radiates or receives the radiant signal energy itself must form a substantial portion of the primary or secondary winding involved in the coupling to or from a signal receiver or source to be classified herein.

SEE OR SEARCH THIS CLASS, SUBCLASS:

857, for antennas having coupling to spaced points thereon wherein such coupling may be by transformer means.

866+, for loop type antennas.

SEE OR SEARCH CLASS:

336, Inductor Devices, pertinent subclasses for transformer structure.

857 This subclass is indented under subclass 850. Subject matter wherein the coupling network includes a plurality of electrical paths, which may include a balanced path, connected to physically spaced points on the active portion of the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

731+, and 739+, for antennas with energy absorbing means remote from the feed line coupling or with feedback coupling which may be coupled to plural points of the active portion of the antenna.

743, for high frequency loop type antennas which involves coupling to spaced points on the loop.

793+, for dipole antennas which may involve connections to spaced points on the active portion of the dipole.

858, for antennas having a coupling network including plural paths coupled respectively to more than one termination.

858 This subclass is indented under subclass 850. Subject matter wherein the passive network has one termination to which an antenna is connected, and has in addition a plurality of dis-

tinct terminations, adapted to be connected to a plurality of transmitters and/or receivers; the coupling network providing a branched electrical path from the antenna termination to the other terminations.

(1) Note. Subject matter involving the combination of an antenna, transmitter and receiver, even in the event the transmitter and receiver are claimed by name only, are not classified in the subclass but will be found in Class 370, subclasses 276+ where the systems are duplexing systems (e.g., adapted for simultaneous transmission and reception of messages): otherwise, classification is in Class 455, Telecommunications, appropriate subclasses.

(2) Note. Combinations of an antenna, coupling network and a plurality of receivers or transmitters are classified in this subclass unless an active element or network, or significant structure of a transmitter or receiver is claimed. For definitions of active element or network, or significant structure, see (3) Note below. In such cases, where in addition the combination is adapted for simultaneous transmission or reception of plural messages (e.g., multiplexing) classification is in this class (370), appropriate subclasses, otherwise, classification falls with transmitters in Class 455, subclasses 91+ or with receivers subclasses 30+.

(3) Note. An active element or network is defined for purposes of classification as an element or network whose energy output is modified due to the presence of a source of energy in the element or network (other than the mere signal energy which passes through the network), or an element or network in which the energy output from a source of energy is controlled by the signal input. For purposes of classification, those portions of the receiver or transmitter connected in immediate consecutive relationship with what may be termed the coupling network proper are not considered to be significant receiver or transmitter structure unless they contain an active element.

SEE OR SEARCH THIS CLASS, SUBCLASS:

175+, and 200+, for duplexing and multiplexing radiant energy communication systems, respectively. See also (1) Note and (2) Note, above.

852, for a single antenna with a plural path coupling network, which also has impedance matching.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, particularly subclasses 1+ for plural channel wave transmission systems. See also the Search Notes under subclass 1 of Class 333.

455, Telecommunications, subclasses 132+ for radio receivers which may involve antennas with coupling to plural receivers.

859 This subclass is indented under subclass 850. Subject matter wherein the passive coupling network includes four terminals, one pair of which are for connection to the antenna and the other pair for connection to a source or receiver of signal energy; the network impedance across one pair of terminals being symmetrical and the network impedance across the other pair of terminals being unsymmetrical with respect to a given potential plane (e.g., ground), these impedances being effective to convert symmetrical potential applied at the symmetrical pair of terminals to unsymmetrical potential at the other pair of terminals or vice versa.

SEE OR SEARCH THIS CLASS, SUBCLASS:

814, and 816, for plural balanced doublets which may be connected to an unbalanced source or load.

821, for balanced doublets connected to an unbalanced source or load.

865, for balanced antennas with coupling for a balanced source or load.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclass 25 for balanced to unbalanced coupling networks, per se.

860 This subclass is indented under subclass 850. Subject matter wherein the passive coupling network includes one or more impedance elements constructed or proportioned to substantially eliminate the reflected wave energy between the antenna and the receiver or signal energy source, caused by impedance differences.

(1) Note. Only networks matching a single antenna to a single frequency, source or load are classified in this subclass. Subject matter involving plural antennas matched to a single source or load is classified in subclasses 853+ above, and subject matter involving a single antenna matched to a plural source or load is classified in subclass 858 above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

745+, for antennas with variable reactance for tuning such antennas which may involve impedance matching.

822, for balanced doublets with an impedance matching coupling network.

852, for plural path antennas with coupling circuits with impedance matching.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 32+ and 124+ for wave transmission lines and networks involving impedance matching or impedance matching networks, per se.

861 This subclass is indented under subclass 860. Subject matter wherein at least one of the impedance elements has an adjustable electrical characteristic.

SEE OR SEARCH THIS CLASS, SUBCLASS:

723, for single adjustable length electrically long linear antennas.

745+, for antennas with variable reactance for tuning.

750, for antennas with adjustable reactance for loading.

823, for adjustable length balanced doublets.

854, for plural antennas with an adjustable coupling network.

868, for loop type antennas of adjustable configuration.

862 This subclass is indented under subclass 860. Subject matter under the definition of ... in which at least one of the elements of the impedance matching network has distributed electrical parameters.

SEE OR SEARCH THIS CLASS, SUBCLASS:

782, for wave guide antennas with means reducing reradiation into the active antenna.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 33+ for impedance matching coupling networks having long line elements.

863 This subclass is indented under subclass 862. Subject matter wherein the distributed parameter electrical element of the impedance matching network lies along the path of wave propagation through the network and has a physical dimension progressively increasing or decreasing along the path of propagation to result in a corresponding change in electrical parameters of the distributed parameter element.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclass 34 for impedance matching networks in general with a tapered long line element.

864 This subclass is indented under subclass 862. Subject matter wherein the impedance matching network element having distributed electrical parameters lies along the path of wave propagation through the network and is an odd integral number (including unity) of quarter-wave lengths long.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclass 35 for impedance matching networks in general having a quarter-wave transformer.

865 This subclass is indented under subclass 850. Subject matter wherein the coupling network and antenna are electrically balanced.

(1) Note. In the balanced doublets of subclasses 793+, the masses are not only electrically balanced; but also are substantially alike and are symmetrically disposed on opposite sides of the lead-in terminals.

SEE OR SEARCH THIS CLASS, SUBCLASS:

731+, especially subclasses 733 and 735, for traveling wave type antennas which may be balanced.
740, for balanced antennas with a terminating resistance at the open end.
741+, for high frequency loop type antennas which may be balanced.
745+, especially subclasses 747 and 748, for antennas with variable reactance for tuning.
791, and 792, for sleeve type antennas which may be balanced.
814, 816 and 820, for balanced doublets with coupling networks. See (1) Note above.
829+, for fractional, multiple, or full wave linear type antennas with grounding structure, including counterpoises.
859, for antennas with balanced to unbalanced coupling networks.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 4+ and 25+, for wave transmission networks involving balanced circuits.

866 This subclass is indented under subclass 700. Subject matter including a coil of one or more turns adapted to be connected at its ends to a pair of lead-in terminals, and further adapted to establish in or receive from space radio wave energy together with a frame for establishing a particular shape or pattern of shapes for the coil, or the coil has sufficient rigidity to establish a shape without the frame.

(1) Note. The loops in this and the indented subclasses form with the source or load circuitry connected thereto a series circuit, as opposed to the antennas of subclass 895 in which a single terminal feeds to or from the antennas to leave an end electrically free.

(2) Note. As between loop antennas and the inductor devices of Class 336, the claiming of an antenna by name only or the recitation of structure peculiar to antennas would classify the patents in this subclasses (866+). If the disclosure is a loop antenna, but the claims merely recite an inductor device, classification is in Class 336.

(3) Note. Loop antennas wherein the coil has a particular shape or configuration are classified in this subclass (866).

SEE OR SEARCH THIS CLASS, SUBCLASS:

726, and 728, for plural separate diverse type antennas including a loop antenna.
732, for loop antennas having energy absorbing means remote from the feed line coupling.
741+, for high frequency type loops.
748, for loop type antennas with variable reactance for tuning.
764, for loop antennas having means for scanning, sweeping or orienting the antennas in rotary or oscillatory motion.
767+, for slot type antennas.
788, for loop antennas including magnetic material.
803+, for folded dipoles.
842, for loop type antennas with an electrical shield.
855, for plural loop antennas with a coupling network or impedance in the leadin.
895, for spiral or helical type antennas. See also (1) Note above.

SEE OR SEARCH CLASS:

246, Railway Switches and Signals, subclass 8 for inductive type railway signaling.
267, Spring Devices, particularly subclass 69 for coil spring devices.
336, Inductor Devices, see (2) Note, above.

342, Communications: Directive Radio Wave System and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 for directive radio wave energy system which may include a loop antenna as an element thereof.

867 This subclass is indented under subclass 866. Subject matter including a plurality of distinct coils or windings, or including one or more taps on a coil or winding to vary the effective number of coil or winding turns; or including a plurality of loop type antennas as defined in subclass 866 above.

(1) Note. A coil or winding is composed of one or more turns of an electrical conductor. In a plurality of such coils or windings there is also one or more turns of an electrical conductor, but there is a discontinuity in the turns to establish discrete groups or sets of turns.

SEE OR SEARCH THIS CLASS, SUBCLASS:

726, and 728, for plural separate diverse type antennas including a loop antenna.

729, for plural diverse active antennas using the same element which may involve a loop antenna.

742, for plural high frequency type loops.

855, for plural loop antennas with a coupling network or impedance in the leadin.

SEE OR SEARCH CLASS:

336, Inductor Devices, especially subclasses 75+, 115+, 137+, 170+, 172, 173+, 180+, 188, 192, 195, and 220, for plural or tapped inductor coils or windings.

868 This subclass is indented under subclass 866. Subject matter wherein a coil or winding and/or the frame of a single loop type antenna is formed of flexible or relatively movable parts to permit change in the shape, area, or length of the coil or winding.

(1) Note. The change in shape, etc., must be within a single loop antenna for classification in this subclass. If a plurality of loop antennas are relatively movable to provide a change in overall shape, etc., classification is in subclass 867, above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

867, for loop antennas whose effective coil length is adjusted by taps. See also (1) Note, above.

871, for loop antennas with collapsible or foldable frames.

880+, for antennas with an adjustable or collapsible support.

SEE OR SEARCH CLASS:

336, Inductor Devices, subclasses 15, 20 and 137+ for inductor devices adjustable in shape or length.

869 This subclass is indented under subclass 866. Subject matter wherein a support for the loop antenna is provided, which permits the antenna to be rotated about at least one axis.

(1) Note. For classification in this subclass the combination of rotatable support and loop antenna must include significant loop antenna structure. Mere designation of the antenna as a loop antenna or the like is not sufficient for classification here, but rather in Class 248. Class 248 would also receive subject matter where the support structure which is claimed is of general utility.

(2) Note. Where a combination is claimed as in the (1) Note above, but the support has insulating or electrical connector structure associated therewith, classification would be in Class 174.

SEE OR SEARCH THIS CLASS, SUBCLASS:

702, for loop antennas which may be rotatably mounted on radio cabinets.

764, for loop antennas which may be rotatably supported for scanning, sweeping or orienting.

882, for antennas in general with rotatable supports. See also the Search Notes under this subclass (882).

SEE OR SEARCH CLASS:

248, Supports, see (1) Notes above. See also the external search notes under subclass 882 of Class 343 for supporting structure which is applicable also to loop antennas.

870 This subclass is indented under subclass 866. Subject matter wherein the loop type antenna is combined with an electrical connector or terminals whereby the winding of the loop may be connected or coupled to other apparatus.

(1) Note. For classification in this subclass the combination of the loop type antenna and connector or terminal must include significant loop antenna structure. Designation of the antenna only broadly as a loop antenna or the like is not sufficient for classification here, but rather classification would be in Class 174, or Class 439.

SEE OR SEARCH THIS CLASS, SUBCLASS:

876, for switching between antennas and lines which include connector or terminal structure.

867, for loop antennas with a tapped winding.

906, for antennas in general combined with an electrical connector.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, pertinent subclasses for conductor and insulating structure which may be used for connecting loop antennas with associated apparatus. See also (1) Note, above.

439, Electrical Connectors, pertinent subclasses for electrical connectors, which may be used for connecting loop antennas with associated apparatus. See also (1) Note, above.

871 This subclass is indented under subclass 866. Subject matter wherein the frame is composed of relatively movable parts or is of flexible material so that the loop may be folded or collapsed to occupy less space as when it is not in use.

(1) Note. Loop frames which may be readily disassembled are classified in subclass 866 above. For classification in this subclass (871) the loop frame must remain substantially in one piece when folded or collapsed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

868, for loop antennas having frames of relatively movable parts to adjust the loop coil configuration.

880+, for antennas having adjustable or collapsible supports, and particularly subclass 881 for foldable supports.

915, for reflectors or directors which are collapsible, foldable or adjustable.

SEE OR SEARCH CLASS:

211, Supports: Racks, particularly subclasses 104+, 118 and 195+ for foldable or collapsible article supports and racks.

248, Supports, particularly subclass 121 for stands and brackets and subclasses 200+ for brackets which may involve collapsible or foldable frames.

336, Inductor Devices, subclasses 196+, and particularly subclass 208, for inductor coils which may involve collapsible or foldable frames for such coils.

872 This subclass is indented under subclass 700. Subject matter wherein a unitary covering or housing is provided which substantially surrounds the antenna in operation, and which freely passes radio waves so as not to interfere materially with the transmission or reception of the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

702, for antennas combined with a radio cabinet.

719, for underground or underwater type antennas, which may have a casing or covering.

784, for closures in wave guide type antennas or horns.

789, for antennas located within a conductive apertured wall.

841, for antenna shields.

889, for rod type antennas retractable into a support.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclass 431 for instrument casings.

174, Electricity: Conductors and Insulators, particularly subclasses 17+ and 50+ for boxes and housings peculiarly adapted for electrical devices.

220, Receptacles, particularly subclasses 2.1+ for receptacles for electrical devices in general, where no specific electrical features are claimed.

312, Supports: Cabinet Structure, particularly subclass 7, for radio type cabinets which may be used to house antennas.

315, Electric Lamp and Discharge Devices: Systems, subclass 34 for integral structural combinations of antennas and discharge devices.

324, Electricity: Measuring and Testing, subclass 156 for casings for electrical measuring instruments.

336, Inductor Devices, particularly subclasses 90+ for casings and housings for inductor devices.

361, Electricity: Electrical Systems and Devices, subclasses 605+ and 641+ for housings for the structure of electrical switchboards or plural electrical components.

428, Stock Material or Miscellaneous Articles, appropriate subclasses, for a stock material product in the form of a single or plural layer web or sheet which may embody a material that inherently freely passes electromagnetic waves.

455, Telecommunications, subclasses 280+ for radio receivers which include antennas and housings for such radio receivers and antennas.

D14, Recording, Communication, or Information Retrieval Equipment, particularly subclasses 188+ which includes radio receivers, tuners, etc. generally and subclasses 230+ which includes antennas and components thereof.

873 This subclass is indented under subclass 872. Subject matter wherein the antenna is embedded or potted in, or coated by a protective cover or support.

SEE OR SEARCH CLASS:

106, Compositions: Coating or Plastic, pertinent subclasses for coating or plastic compositions in general.

174, Electricity: Conductors and Insulators, particularly subclasses 24+, 50+ and 110+ for insulated conductors and conductor housings.

336, Inductor Devices, subclasses 96 and 205, for inductor devices having potted and embedded windings, respectively.

874 This subclass is indented under subclass 700. Subject matter including a tower or mast which transmits or receives radio waves; the tower or mast having structure which facilitates this transmission or reception of radio waves, or the tower or mast serving, in addition, as a support for other radio wave radiating or receiving structure.

(1) Note. A tower antenna herein comprises a metallic elongated structure of substantial height, generally of lattice type and constructed of component metallic elements such as I beams or girders, and is adapted to radiate or receive radiations of radio wave energy.

(2) Note. A mast antenna is usually a substantially solid, hollow, or built up pole-like element of metallic composition capable of radiation; and is distinguished from the rod type antennas of subclass 900 which are normally of negligible mass and relatively short, in that the masts of this subclass have appreciable weight and height and are adapted structurally to support such weight.

SEE OR SEARCH THIS CLASS, SUBCLASS:

715, for rod type antennas supported by a vehicle body.

723, for single adjustable length electrically long linear antennas.

825+, and 843, for mast or tower type antennas of appreciable electrical length or dimension, respectively.
890, for antenna supports of the post, standard or tower type.
896, for cage or hollow post type antennas.
900+, for rod type antennas, per se.

SEE OR SEARCH CLASS:
52, Static Structures (e.g., Buildings), subclasses 720+ for a residual rigid elongated unit not defining an electrical detail for Class 343.
174, Electricity: Conductors and Insulators, particularly subclass 45 for towers, poles or posts for supporting overhead conductors.

875 This subclass is indented under subclass 874. Subject matter wherein the antenna mast or tower is composed of multiple discrete vertical sections.

SEE OR SEARCH CLASS:
52, Static Structures (e.g., Buildings), subclasses 720+ for residual rigid elongated structure not defining any electrical feature for Class 343.

876 This subclass is indented under subclass 700. Subject matter including an antenna and a switch for electrically connecting the antenna selectively to two or more lines, or including two or more antennas and a switch for connecting a line selectively to these antennas, or including a plurality of antennas and a switch for making selective connections among these antennas and a plurality of lines.

SEE OR SEARCH THIS CLASS, SUBCLASS:
768, for slot type antennas with periodic control of the slot or coupling.
777, for plural wave guide type antennas with control of the individual antenna.
778, for plural wave guide type antennas with phasing means.
814, for plural doublets with coupling networks.
854, for plural antennas with coupling means having periodically varied control.
858, for a single antenna coupled to plural leadins.
904, for antennas combined with switches.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, particularly subclasses 1+, 19.01+, 51.02+, 51.05+ for plural circuit switches.
307, Electrical Transmission or Interconnection Systems, particularly subclasses 23, 38+, 64+, 80+, 85+, 98+, and 112+ for miscellaneous electrical distribution systems which include switching.
333, Wave Transmission Lines and Networks, subclasses 101+ for wave transmission branch systems having switching between branches.
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 106+ for switches of the electromagnetic type adapted to complete a plurality of circuits.
340, Communications: Electrical, particularly subclasses 825+ for miscellaneous electrical communication systems which may involve switching.
439, Electrical Connectors, particularly subclass 18 for electrical connectors which may connect and disconnect multiple circuits.
455, Telecommunications, subclasses 132 and 277.1+ for radio receiver diversity systems which may include this type of switching.

877 This subclass is indented under subclass 700. Antennas together with a reel on which the antenna may be wound.

(1) Note. The combination of an antenna, recited by name only, or the recitation of structure which adapts the antenna to winding such as the term “flexible wire”, and a reel is not classified in this subclass, If to this combination is added terminal or connecting means permitting transmission of electrical energy to or from the antenna, classification is elsewhere. If structure is recited to indicate the length of wire unwound from the reel classification is elsewhere. See the Search Class notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

707, for aircraft combined with trailing type antennas.

903, for telescoping rod type antennas actuated by a flexible rod, which may be wound on a reel.

SEE OR SEARCH CLASS:

33, Geometrical Instruments, particularly subclasses 732+ for means to indicate and measure the length of antenna unwound, provided no significant antenna structure is recited. See also (1) Note, above.

114, Ships, subclass 311 for drags and sea anchors.

188, Brakes, subclasses 378+ for vibration dampers which use the inertia of a damping mass to dissipate motion; and subclass 381 for dampers using friction between elements to dissipate motion.

191, Electricity: Transmission to Vehicles, especially subclasses 12.2+ for reels on which flexible conductors wound for transmitting electrical energy. See also (1) Note, above.

242, Winding, Tensioning, or Guiding, subclasses 370+, particularly subclasses 390.2, 390.3, and 917, for the combination of an antenna, recited by name only, or the recitation of structure which adapts the antenna to winding such as the term “flexible wire”, and a reel. See also (1) Note, above.

244, Aeronautics and Astronautics, subclass 1 for nominal trailing antennas.

254, Implements or Apparatus for Applying Pushing or Pulling Force, subclasses 266+ for apparatus for hauling or hoisting a load including a driven drum for pulling on a cable attached to the load.

878 This subclass is indented under subclass 700. Antennas including structure for maintaining the antennas or parts thereof in a fixed position or path of movement (adjustable) with respect to some other body or the earth.

(1) Note. For classification of the combination of an antenna and a support in this and the indented subclasses, there must be recited some significant antenna structure, i.e., structure that contributes electrically to the transmission of the signal between the receiver or transmitter and space through the antenna. The combination of an antenna claimed by name only and a support therefor claimed in detail is classified in Class 248. If in addition insulating features are recited classification is in Class 174, even though the signal leadin, or terminal is recited. See also (2) Note under subclass 888, below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

707, for antennas of the trailing or drag type.

713+, and 717, for antennas supported by a vehicle.

718, for antennas with body attaching means.

866+, for frames for loop antennas.

874+, for mast or tower type antennas.

877, for antennas wound on reels.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclass 40 for a shaft or tower with an article or article support wherein no electrical feature for Class 343 is defined.

174, Electricity: Conductors and Insulators, particularly subclasses 40+, 84+, 138, 151+, and 158+, conductors and insulators in general involving supports.

211, Supports: Racks, particularly subclasses 119.01+ for rack type supports in general.

248, Supports, for supports in general.

285, Pipe Joints or Couplings, for pipe joints which may involve supports.

362, Illumination, particularly subclasses 382+, for supports for illuminating devices.

879 This subclass is indented under subclass 878. Subject matter wherein the support is peculiarly adapted to support two or more separate and distinct antennas.

(1) Note. A mere plurality of antennas with their separate supports does not fall within this subclass. To be classified herein the support must be unitary in nature, the parts or sections thereof cooperating to support two or more separate antennas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

742, for plural high frequency type loops involving supports.
770, for plural slot type antennas which involve supports.
774, and 776+, for plural wave guide type antennas involving supports.
796, 797+, 799+, and 810+, for plural dipoles involving supports.
824, for planar type high frequency arrays involving supports.
835+, for plural antennas combined with reflectors involving supports.
844, for plural antennas spaced a fractional or full wave length apart involving supports.
867, for plural loop type antennas involving supports.

880 This subclass is indented under subclass 878. Subject matter wherein the support is composed of multiple parts which are relatively movable or adapted to receive the antenna to permit adjustment, collapse, or knock-down of the support and/or the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

713+, for antennas supported by a vehicle body which may be adjustable.
757+, for antennas combined with means for moving directive antennas for scanning, sweeping or orienting.
805, for dipoles having the arms angularly adjustable.
823, for adjustable length dipoles.
839, for reflectors and antennas which are relatively movable.
868, for loop antennas having adjustable configuration, area or coil length.
869, for loop antennas with a rotatable support.
871, for loop type antenna and frame which may be collapsible or foldable.
889, for rod antennas which are retractable into their supports.
901+, for telescoping type rod antennas.
915, for collapsible and adjustable reflectors and directors.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclass 161 for adjustable or movably mounted insulator supports.
248, Supports, particularly subclasses 48, 59, 70, 122, 161+, 165, 178+, 274.1+, 323+, and 354+, for adjustable and collapsible supports in general.
362, Illumination, particularly subclasses 418+, for adjustable or collapsible illuminating devices.

881 This subclass is indented under subclass 880. Subject matter wherein the support is composed of multiple parts which are so joined together that the parts have different relative positions in use and non-use to permit the antenna to be folded into a more compact space when not in use.

(1) Note. Antennas with supports which may be completely disassembled when not in use, i.e., the “knock-down” type, are classified elsewhere. See the search note below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

880, for antennas with supports which may be completely disassembled when not in use, i.e., the “knock-down” type,

SEE OR SEARCH CLASS:

211, Supports: Racks, subclasses 85, 104+, 118, 167, 186+, and 195+, for subject matter including special types of foldable supports and racks.
248, Supports, particularly subclasses 46+, 136, 150, 166+, 190, 240, and 308 for foldable supports.

882 This subclass is indented under subclass 880. Subject matter wherein the support has parts relatively pivoted or rotatable to permit the antenna mounted on one of the parts to be pivoted or rotated, or the support receives the antenna in pivoted or rotatable relation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

711+, for antennas supported from a vehicle body which may include pivoted or rotatable features in the support.

757+, for antennas with means for moving a directive antenna combined with means for rotatably supporting the antenna.

805, for dipole antennas having the arms angularly adjustable.

839, for reflectors and antennas relatively movable.

869, for loop antennas with rotatable supports.

900, for rod type antennas having flexible joints.

915, for foldable, collapsible, or adjustable reflectors and directors.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 137+, and particularly subclasses 138, 151+ and 161, for pivoted or rotatable insulating means.

248, Supports, subclasses 38+ and particularly subclasses 43, 44 and 45, for pivoted or rotatable-staff stands, bases or brackets; subclass 81 for pivoted standards for a hose or nozzle; subclass 128 for stands for movable receptacles; subclass 160 for flexible standard-type stands; subclasses 178+ for adjustable head article-support stands; subclasses 274.1+ for adjustable brackets; subclasses 324+ for suspended supports having adjustable, pivoted parts; and subclass 349.1 for rotatable supporting bases.

285, Pipe Joints or Couplings, subclass 51 for insulated ball and socket joints, subclasses 136.1+ for a pipe or rod-to-pipe-to-plate joint system, especially subclass 138.1, subclasses 261+ for a ball and socket pipe joint, and subclasses 305+ for a pipe coupling having catch means holding the coupled members together. See the Search Notes thereunder.

403, Joints and Connections, subclasses 52+ for articulated connections in general.

883 This subclass is indented under subclass 880. Subject matter wherein the support is constructed of multiple sections capable of sliding motion within each other to be extensible or retractable.

SEE OR SEARCH THIS CLASS, SUBCLASS:

823, for dipoles with telescoping arms.

871, for loop antennas with collapsible loop frames which may have telescopic features.

889, for rod antennas retractable into their supports.

901, for telescopic rod antennas.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclass 632 for axially extensible shaft or openwork; and subclass 831 for elongated rigid structure, particularly subclass 848 for end-to-end connected shaft sections wherein no electrical feature for the transmission or reception of radio wave energy is claimed.

174, Electricity: Conductors and Insulators, subclass 69 for extensible conductors.

285, Pipe Joints or Couplings, subclasses 298+ for adjustable length pipe joints or couplings. See the Search Notes thereunder.

403, Joints and Connections, subclasses 52+ for articulated connections in general.

884 This subclass is indented under subclass 878. Subject matter wherein the support for the antenna also constitutes a transmission line, such as a coaxial line or wave guide, for feeding the signal energy to or from the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

767+, for slot type antennas wherein the slot feed constitutes a support.

772+, for wave guide type antennas wherein the antenna feed constitutes a support.
790+, for sleeve type antenna, whose feed constitutes a support.
825+, for fractional, multiple, or full wave length linear type antennas, whose feed constitutes a support.

885 This subclass is indented under subclass 878. Subject matter combined with means to modify the electrical characteristics of the support.

(1) Note. This subject matter includes, for example, conductor means to prevent concentration of electrical stress, conductor or insulator means to modify the voltage gradient, and means for electrically grading sections of the support.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 140+ for insulators combined with conductive arcing or stress distributing means. Note particularly the notes thereunder.

886 This subclass is indented under subclass 878. Subject matter wherein the support includes two or more spaced apart poles, standards, or other upright members which maintain an antenna or antenna component therebetween in a substantially horizontal and elevated position.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 40+ for supports and other details for overhead cables, conduits, and conductors.
191, Electricity: Transmission to Vehicles, subclasses 40+ for supports for trolley conductor wires.
211, Supports: Racks, subclasses 119.01+ for isolated supports with flexible article supporting strand or strands joining the supports.

887 This subclass is indented under subclass 878. Subject matter where the support for the antenna or reflector has a stream-line configuration to permit an unbroken flow of fluid past the support free from turbulence and with the least resistance.

SEE OR SEARCH THIS CLASS, SUBCLASS:
872+, for protective supports or covers for antennas which may have a stream-line shape.
908, for active antenna components having a distinctive contour.

SEE OR SEARCH CLASS:
244, Aeronautics and Astronautics, particularly subclass 130, for aircraft structure details for reducing aerodynamic resistance.
D14, Recording, Communication, or Information Retrieval Equipment, particularly, subclasses 140+ for design patents for telephone and telegraph instruments which may include antenna support designs.

888 This subclass is indented under subclass 878. Subject matter wherein the supported antenna has a rod-like end portion, and the support is peculiarly adapted to engage this rod-like end portion.

(1) Note. The antennas in this subclass are usually rods supported at an end.

SEE OR SEARCH THIS CLASS, SUBCLASS:
715, for rod type antenna supported from a vehicle body.
872+, for protective supports or covers for antennas.
874+, for mast or tower type antennas.
882, for pivoted supports which may be combined with a rod-like antenna.

SEE OR SEARCH CLASS:
52, Static Structures (e.g., Buildings), appropriate subclasses for poles or posts of more general application even though such structure be merely defined as an antenna or antenna support, particularly subclass 110 for a rod attached to a vehicle body, 111+ for a mechanism operated or relatively movable shaft assembly, 651.01+ for elongated three-dimensional openwork, and 720+ for miscellaneous shaft structures.

174, Electricity: Conductors and Insulators, appropriate subclasses for an antenna rod claimed by name only together with an insulating support and an electrical connector or terminal structure for connecting the rod to its energy source or load, particularly subclasses 84+ for conduits, cables and conductors combined with joints which may involve rod-like conductors; subclasses 138+ for insulators of special application; subclasses 151+ for insulators extending through a wall or plate; subclasses 158+ for insulator supporting or attaching means which may be used to support rods.

248, Supports, for an antenna rod defined by name only with a detailed support structure for that class, particularly subclasses 38+ for supports for staff type objects.

285, Pipe Joints or Couplings, pertinent subclasses, for pipe joints or couplings which may be used in supports for rod-like antennas which are supported at an end.

403, Joints and Connections, appropriate subclasses for a rod joint of general application.

889 This subclass is indented under subclass 888. Subject matter wherein the rod type antenna is retractable into the end supporting means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

714, and 715, for extensible and retractable antennas supported by vehicle bodies.

789, for antennas within a conductive apertured wall.

823, for dipole antennas having telescoping arms.

872+, for antennas having a protective support or cover in which the antenna may be retracted.

901+, for telescoping rod type antennas.

SEE OR SEARCH CLASS:

285, Pipe Joints or Couplings, subclasses 145.1+ for telescopic ball and socket pipe joints and couplings, and subclasses 298+ for adjustable length pipe joints and couplings.

403, Joints and Connections, subclasses 52+ for articulated connections in general.

890 This subclass is indented under subclass 878. Subject matter wherein the support includes a post, standard or tower extending vertically to maintain the antenna or component thereof in an elevated position.

(1) Note. In this subclass the post, standard or tower merely supports the antenna, as distinguished from subclass 874 wherein the mast or tower constitutes in itself at least part of the active antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

742, 774, 796, 798, and 800, for particular types of antennas which may be stacked on a pole, post or standard.

790, for sleeve type antennas surrounding a support.

874+, see (1) Note, above.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), appropriate subclass for a residual elongated rigid structure and see the reference thereto in subclass 700 of Class 343.

174, Electricity: Conductors and Insulators, subclass 45 for towers, poles or posts supporting overhead conductors.

182, Fire Escape, Ladder, or Scaffold, subclasses 48+ for a fire escape tower.

248, Supports, subclasses 80+, 97+, 105, 109, 116, 117.2+, 126, 127, 469+, 519+, and 676 for stand-type supports in general or for supporting particular objects.

891 This subclass is indented under subclass 890. Subject matter wherein the post, standard or tower has an antenna wire extending along its length, and constitutes the sole support for the wire.

SEE OR SEARCH THIS CLASS, SUBCLASS:

799+, for vertically arranged dipoles, which may extend along a post.

874+, for mast or tower type antennas which may have vertically extending wires forming a uniform electrical cross-section.

892 This subclass is indented under subclass 878. Subject matter wherein the support is an overhanging structure attached to and projecting from some body such as a wall or post and engages the antenna or a component thereof outside the body, and is laterally offset from or suspended from the body to maintain the antenna or component in a fixed position or path of movement.

SEE OR SEARCH THIS CLASS, SUBCLASS:

717, for antennas supported underneath a vehicle.

888, for brackets supporting the rod-like end portion of an antenna.

SEE OR SEARCH CLASS:

248, Supports, subclasses 48.2, 65+, 103+, 115, 121+, 126, 200+, 332, 475+, 519+, and 674+ for brackets in general.

893 This subclass is indented under subclass 700. Combinations of two or more antennas and not specially provided for above.

(1) Note. Antennas of no particular type and with no significant spacing or coupling, but arranged in particular patterns, are classified here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

725+, for plural separate diverse type antennas.

729+, for plural diverse type antennas using the same active element.

737, for plural traveling wave type antennas.

742, for plural high frequency type loops.

751, for plural antennas having lumped reactance for loading.

758, for plural relatively movable directive antennas with means for moving, for scanning, sweeping or orienting.

770+, for plural slot type antennas.

774, for stacked biconical horn type antennas.

776, for plural wave guide type antennas.

794, 796, 797+, 799+, and 810+, for plural center-fed doublet antennas.

824, for planar type high frequency arrays.

826+, for plural linear type antennas of fractional, multiple or full wave length.

835+, for plural active antennas with a reflector.

844, for plural antennas spaced a fractional or full wave length apart.

852, for plural antennas with impedance matching coupling.

853+, for plural antennas with coupling networks.

867, for plural loop type antennas.

876, for antennas with switching between the antennas and line.

879, for plural separate antennas with a support.

SEE OR SEARCH CLASS:

342, Communications: Directive Radio Wave System and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 for radio wave energy communications systems, which may have a plurality of antennas.

455, Telecommunications, subclasses 272+ for receivers which may have a plurality of antennas.

894 This subclass is indented under subclass 700. Antennas having a signal, indicator or alarm responsive to a condition of the antenna or its components.

(1) Note. Patents within the subclass definition involving testing are classified in this subclass if the testing involves indicating as herein defined.

(2) Note. Patents within the subclass definition which involve measuring of the signal energy in addition to indicating are not classified here but in subclass 703, above.

SEE OR SEARCH THIS CLASS, SUBCLASS:

703, for antennas having means for measuring and testing a condition of the antenna.

721, for antennas with lights which do not indicate a condition of the antenna.

760, for antennas having means for scanning, sweeping, or orienting together with a signal, indicator or alarm for such scanning, sweeping or orienting.

SEE OR SEARCH CLASS:
33, Geometrical Instruments, pertinent subclasses, for gauges or other means which may be used in the indication of length, etc., for extensible antennas.
73, Measuring and Testing, for measuring and testing processes and apparatus in general.
116, Signals and Indicators, for mechanical signals, alarms and indicators in general.
324, Electricity: Measuring and Testing, for electrical measuring and testing.
340, Communications: Electrical, for electrical signaling devices in general.

895 This subclass is indented under subclass 700. Subject matter wherein the antenna includes a wound conductor, and the winding advances in a single plane (spiral), or over a surface of a solid such as cylinder (helix) or sphere.

(1) Note. Antennas in this subclass and in subclasses 866+ (loops) form continuous electrical circuits, but in this subclass (895) there is a single terminal feed to or from the antenna; while in subclasses 866+ both ends of the continuous antenna are connected to the separate lead-in terminals.

SEE OR SEARCH THIS CLASS, SUBCLASS:
843, for antennas having an appreciable wave length dimension which may be spiral or helical.
866+, for loop type antennas. See also (1) Note, above.
896, for cage type antennas.

SEE OR SEARCH CLASS:
267, Spring Devices, particularly subclasses 73+ for coil springs which may be used as antennas.
336, Inductor Devices, particularly subclasses 225+ for inductor devices.

896 This subclass is indented under subclass 700. Subject matter wherein the antenna is formed of conductive rods, wires or mesh screens enclosing a space and wherein such rods, wires or screens are connected together galvanically to form a single electrical mass.

(1) Note. Antennas in this subclass and in subclasses 866+ may form continuous electrical circuits, but in this subclass (896) there is a single terminal feed to or from the antenna; while in subclasses 866+ both ends of the continuous antenna are connected to the separate lead-in terminals.

SEE OR SEARCH THIS CLASS, SUBCLASS:
804, for multiple conductor type folded dipoles.
808, for doublet antennas whose plural-rod arms form a V.
843, for antennas having an appreciable wave length dimension which may involve cage-like structure.
866+, for loop type antennas. See also (1) Note, above.
874+, for mast or tower type antennas which may involve cage-like structure.
895, for spiral or helical type antennas.

897 This subclass is indented under subclass 700. Subject matter wherein the antenna is formed of conductive strips or strands in mesh, braided, or woven form, or interwoven with non-conductor strips or strands, or wherein the antenna is formed of multiple conductive strips in sheet or planar form not provided for elsewhere.

(1) Note. A mere fabric of insulating material with metallic conductors interwoven therewith or a metal fabric which may be used as an antenna is not classified here, but in such classes as 66, Textiles: Knitting, subclass 202, 87, Textiles: Braiding, Netting, and Lace Making, subclasses 1 through 13, or 139, Textiles: Weaving, subclass 425. See the Search Notes below for a more detailed fabric search. For classification in this subclass there must be claimed some limitation which peculiarly adapts the

fabric structure to antenna operation, such as the antenna leadin.

SEE OR SEARCH THIS CLASS, SUBCLASS:

907+, for antenna components, per se.

SEE OR SEARCH CLASS:

57, Textiles: Spinning, Twisting, and Twining, subclasses 200+ for strand structure.

66, Textiles: Knitting, subclass 202, for a knitted fabric of or including metal strands.

87, Textiles: Braiding, Netting, and Lace Making, subclass 1 for products of braiding and netting processes.

139, Textiles: Weaving, subclass 425 for fabric materials including metals. See (1) Note, above.

174, Electricity: Conductors and Insulators, subclasses 121, 122 and 124, for conduits, cables or conductors in fibrous or fabric insulation.

245, Wire Fabrics and Structure, subclasses 2+ for wire fabrics.

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

442, Fabric (Woven, Knitted, or Nonwoven Textile or Cloth, etc.), subclasses 181+ for a woven fabric, subclasses 304+ for a knit fabric, and subclasses 327+ for a nonwoven fabric.

898 This subclass is indented under subclass 700. Subject matter wherein a substantial portion of the active antenna is hollow and of metal.

SEE OR SEARCH THIS CLASS, SUBCLASS:

767+, for slot type antennas which may involve hollow metallic bodies.

772+, for wave guide type antennas.

790+, for sleeve type antennas.

807, for balanced doublets having thick or enlarged arms which may be hollow.

831, for stub type multiple or full wave antennas which may be hollow.

896, for cage or hollow post antennas formed of rods or wire.

899 This subclass is indented under subclass 700. Subject matter wherein the antenna is so formed as to present a larger surface to the radio wave transmitting medium; or wherein additional elements are combined with the antenna for increasing the surface presented to the radio wave propagating medium; or wherein elements are provided which are adapted to be electrically connected to the antenna to increase the surface presented to the radio wave propagating medium.

(1) Note. Examples of this area increasing structure are a spiniferous shaped antenna and a metal mass such as a ball on the free end of a rod type antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

749+, for antennas with lumped inductance or capacity for loading.

795, and 807, for sheet or wing type doublets, and tapered, thick, or enlarged doublets, respectively.

802, for balanced center-fed doublet antennas with distributed reactance added to the doublet arms.

811, for fish-bone type arrays of balanced center-fed doublet antennas.

828, for antennas of significant electrical length having a nonuniformity therein.

831, for stub type antennas of significant electrical length.

896, for cage type antennas formed of rods or wires.

898, for hollow metallic body type antennas.

908, for antenna components having a distinctive contour or shape.

900 This subclass is indented under subclass 700. Subject matter wherein the antenna is of substantially fixed or stiff elongated form of no claimed significant electrical length.

SEE OR SEARCH THIS CLASS, SUBCLASS:

715, for rod type antennas significantly related to vehicle structure.

825+, for rod type antennas of a significant electrical length.

874+, for mast or tower type antennas.

888+, for rod type antennas with a support therefor.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), appropriate subclasses for supported poles or posts of more general application and having no features for antenna use, particularly subclass 110 for a shaft supported on a vehicle body, 111+ for a mechanism operated or relatively movable shaft, and 292+ for a pole or post footing.

138, Pipes and Tubular Conduits, subclasses 140 through 178 for metal pipe of the type which may be used in antennas.

174, Electricity: Conductors and Insulators, appropriate subclasses for an electrically insulated or connected rod which may be merely defined as an antenna with no mechanical or electrical structure specialized making it an antenna, particularly subclasses 68.1+ for miscellaneous conduits, cables or conductors, and 137+ for electrical insulators.

285, Pipe Joints or Couplings, appropriate subclasses for such joints having no claimed electrical limitation for antenna.

403, Joints and Connections, appropriate subclasses for rod joints of general application.

428, Stock Material or Miscellaneous Articles, subclasses 544+ for stock materials, e.g., or indefinite length, which are all metal or have adjacent metal components which may be used in rod-like antennas.

901 This subclass is indented under subclass 900. Subject matter wherein the elongated antenna is composed of multiple sections capable of sliding motion within each other to be extensible or retractable.

SEE OR SEARCH THIS CLASS, SUBCLASS:

823, for dipoles with telescoping arms for adjusting the length.

871, for collapsible loop frames.

883, for antennas with a telescoping support.

889, for rod antennas retractable into a support.

SEE OR SEARCH CLASS:

52, Static Structures (e.g., Buildings), subclass 121 for a shaft of more general application which is longitudinally extensible by a flexible drive or hoist.

174, Electricity: Conductors and Insulators, subclass 69 for conductors which are extensible.

285, Pipe Joints or Coupling, subclasses 298+ for adjustable length pipe joints or couplings.

902 This subclass is indented under subclass 901. Subject matter including structure which provides adjustment of the telescoping position of the antenna sections in response to change in the pressure of a fluid.

(1) Note. For classification in this subclass there must be some claimed electrical limitation as opposed to a mere recitation of a fluid motor or expansible chamber device structure. The mere recitation that the device or a mounting therefor is formed of insulating or conducting material, if the claim is otherwise directed to a fluid motor or an expansible chamber device, will not preclude classification in a fluid motor or expansible chamber device class.

SEE OR SEARCH CLASS:

60, Power Plants, subclasses 325+, for a fluid pressure means which may be used for extending or retracting antennas.

91, Motors: Expansible Chamber Type, appropriate subclasses for expansible chamber motors, per se.

92, Expansible Chamber Devices, appropriate subclasses for an expansible

chamber device in which the piston or cylinder is disclosed as an antenna.

123, Internal-Combustion Engines, appropriate subclasses for fluid pressure means of the internal combustion (or explosive) type confined to a cylinder.

903 This subclass is indented under subclass 901. Subject matter including a flexible rod for adjusting the telescoping position of the antenna sections in response to movement of the rod.

(1) Note. Usually the rod extends within the antenna. Often the rod is wound on a reel.

SEE OR SEARCH THIS CLASS, SUBCLASS:

714, for adjustable antennas significantly related to vehicle structure which may be operated by a rod.

877, for antennas combined with a reel on which the antenna is wound.

889, for rod type antennas retractable into a support which may be actuated by a rod.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, appropriate subclasses for mechani movements for extending or retracting telescopic antennas, particrly subclass 95 for flexible connec type movements, and subclasses 424.71-424.96 for screw and nut gearing devices adapted to move telescopic sectional elements.

242, Winding, Tensioning, or Guiding, subclasses 370+, particularly subclasses 390.2, 390.3, and 917 for unwinding and rewinding a flexible material which may include an antenna.

904 This subclass is indented under subclass 700. Subject matter wherein the antenna is combined with other structure which perfects it, and which combinations are not provided for above.

(1) Note. See the search this class, subclass references below for particular combinations of antennas within the class definition, such as antennas combined with vehicle structure, with means for moving directive antennas for scanning, sweeping or orienting, and with diverse type art device.

(2) Note. For classification herein, the other structure must be for the purpose of perfecting or improving the antenna in the performance of its primary function, which is the radiation or collection of radio wave energy together with the transmission of such energy to or from the transmitter or receiver, as opposed to subclasses above that are limited to antennas combined with devices or structures having an added purpose or independent utility other than to perfect the antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

711+, for antennas combined with vehicle structure.

757+, for antennas with means for moving directive antennas for scanning, sweeping or orienting

720+, for antennas with diverse type art device.

SEE OR SEARCH CLASS:

200, Electricity: Circuit Makers and Breakers, for the structure of electric switches, per se.

333, Wave Transmission Lines and Networks, subclasses 24+ for wave guides having an antenna coupled within the guide.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigations), subclasses 1 through 205 and 350+ for detailed radio wave energy communication structure combined with an antenna.

455, Telecommunications, appropriate subclasses for radio receivers and/or transmitters including an antenna.

905 This subclass is indented under subclass 904. Subject matter wherein the other structure includes a transmission line.

(1) Note. The transmission line may be shielded, e.g., coaxial line, or be associated with other structure, or have a configuration or arrangement to suppress radiation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

850+, for antennas combined with a coupling network or an impedance in the leadin.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, particularly subclasses 68.1+ for conduits, cables, and conductors.

333, Wave Transmission Lines and Networks, subclasses 100+ for branched circuits in plural channel systems which may be adapted for connection to an antenna, and subclasses 236+ for long lines, per se.

906 This subclass is indented under subclass 904. Subject matter combined with electrical connector structure for connecting an antenna to transmission or feed lines or other apparatus.

(1) Note. The electrical connector may have a shield or other structure associated therewith for suppressing radiation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

850+, for antennas with a coupling network or an impedance in the leadin.

870, for loop antennas with a connector or terminals.

876, for switching between plural antennas and line or between plural lines and antenna.

SEE OR SEARCH CLASS:

439, Electrical Connectors, for electrical connectors in general.

907 This subclass is indented under subclass 700. Components and elements not constituting a complete antenna which are limited to use in antennas and which are not provided for in any preceding subclass or in any other class.

(1) Note. This subclass includes antenna conductors under the class definition which involve the material or composition of the conductor and which conductors are not classifiable in any other class.

(2) Note. This subclass does not provide for the antenna conductor defined only as being formed of a particular composition or material, or only as a base with a coating or lamination thereon. For the excluded subject matter, see SEARCH CLASS below.

(3) Note. This subclass does not provide for antenna conductors which are defined only as a wire or electric conductor. For the excluded subject matter, see SEARCH CLASS below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

707, for aircraft with trailing type antennas.

731+, for traveling wave type antennas which may be combined with energy absorbing means.

741+, for high frequency type loops.

767+, for slot type antennas.

773+, for biconical horn wave guide type antennas.

780, for “pillbox” type antennas.

785, for wave guide antennas of solid liquid or gaseous dielectric type.

786, for horn type wave guide antennas, per se.

787+, for antennas having a magnetic core or auxiliary magnet.

790+, for sleeve type antennas.

793+, for balanced center-fed doublets in general, and pertinent subclasses included therein for special types of doublets and doublets with reflectors or directors.

825+, and 843, for antennas of a particular electrical dimension.

832, for an active antenna used as a reflector.

833, for antennas with a parasitic director.

834+, for antennas with a parasitic reflector.

841+, for antennas with an electrical shield.

846+, for antennas having counterpoises, ground planes or grounding means.
866+, for loop type antennas.
872+, for antennas having protective covers or supports.
874, for mast or tower type antennas.
896, for cage type antennas.
897, for mesh, woven, braided or multiple strip type antennas.

SEE OR SEARCH CLASS:
52, Static Structures (e.g., Buildings), pertinent subclasses for a structural combination of rods and tubes of more general utility.
57, Textiles: Spinning, Twisting, and Twining, subclasses 210+ for strand structure of wire-rope; and subclass 235 for web materials which may be used in antennas.
87, Textiles: Braiding, Netting, and Lace Making, subclasses 8+ for braided strands or fabrics which may be used in antennas.
138, Pipes and Tubular Conduits, subclasses 100 through 178 for hollow stock material such as pipes or tubes which may be used in antennas.
139, Textiles: Weaving, subclass 425 for woven textile structures including metal.
148, Metal Treatment, subclasses 400+ for metal stock which has been treated by a Class 148 process, e.g., heat treated, etc.
174, Electricity: Conductors and Insulators, particularly subclasses 126.1+ for conductor structure.
191, Electricity: Transmission to Vehicles, subclasses 22+ for conductors for transmission of electricity to moving vehicles.
245, Wire Fabrics and Structure, pertinent subclasses for wire fabrics and structure.
252, Compositions, subclass 490 for electrical resistance compositions.
333, Wave Transmission Lines and Networks, particularly subclasses 236+ and 245+ for long lines and long line elements and components.
336, Inductor Devices, particularly subclasses 117 and 222+ for inductor devices with a core of magnetic material and for winding structure including the composition of the windings, respectively.
420, Alloys or Metallic Compositions, for single metals or alloys which may be used in antennas.
428, Stock Material or Miscellaneous Articles, appropriate subclasses, for a stock material product in the form of a single or plural layer web or sheet which may inherently possess desirable properties of an antenna, subclasses 544+ for stock materials, e.g., of indefinite length, which are all metal or have adjacent metal components which may be used in rod-like antennas.

908 This subclass is indented under subclass 907. Subject matter wherein the conductor or other component of the active antenna has a distinctive contour or shape.

(1) Note. This does not include cables of particular cross section, which may be used as antennas. See Class 174 for such subject matter.

SEE OR SEARCH THIS CLASS, SUBCLASS:
767, for radiating slot type antennas.
795, for sheet or wing type balanced doublets.
802, for balanced doublets with distributed reactance added to the arms.
806, for balanced doublets with bent arms.
807, for balanced doublets with tapered, thick or enlarged arms.
828, for linear antenna having a particular electrical length with a non-uniformity therein.
831, for stub shaped antennas having a particular electrical length.
868, for loop antennas of adjustable configuration.
874+, for mast or tower type antennas.
895, for spiral or helical shaped antennas.
896, for cage type antennas.
897, for mesh, woven, braided or multiple strip antennas.
898, for antennas including a hollow metallic body.
899+, for antennas with area increasing means.

SEE OR SEARCH CLASS:

336, Inductor Devices, subclasses 223 and 225+ for coils having distinctive conductor shape and distinctive coil configuration, respectively.

909 This subclass is indented under subclass 907. Subject matter including components which transmit therethrough a radio wave which impinges thereon from space and returns the wave to space after it has passed through and which modify the wave in transmission therethrough usually by delaying or accelerating some portions of the wave more than others, as follows: (1) alters the direction of propagation of the wave, as by refraction; (2) brings the wave front to a focus or converts a plane wave front to a spherical wave front or vice versa (3) changes the type of polarization, e.g., converts a plane polarized wave to a circularly polarized wave, or rotates the plane of polarization; (4) filters one or more polarization components (5) filters one or more frequency components.

(1) Note. This subject matter need not be closely associated with an antenna, but may be applied to a radio beam remote from any antenna, or in a wave guide.

SEE OR SEARCH THIS CLASS, SUBCLASS:

753+, for antennas with spaced electromagnetic lenses or diffractors.

756, for antennas with a polarization filter.

783, for wave guide type antennas having an internal wave refraction means.

912+, for reflectors or directors, per se, which do not transmit the electromagnetic wave therethrough.

SEE OR SEARCH CLASS:

250, Radiant Energy, especially subclasses 505+ for electromagnetic wave polarizers, filters, screens, lenses or refractors, per se, exclusive of infrared, visible light and ultraviolet electromagnetic radiation controlling elements.

333, Wave Transmission Lines and Networks, particularly subclasses 21, 24+, and 248+ for wave transmission systems which may include electromagnetic lenses or refractors; and subclasses 167+ for wave filters.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 205 and 350+ for radio energy communication systems, such as reflected wave systems and beacons, which may include radio wave lenses or refractors.

359, Optics: Systems (Including Communication) and Elements, subclasses 483+ for optical polarizers, subclasses 642+ for optical lenses, and subclasses 350+ 885+ and for optical filters.

910 This subclass is indented under subclass 909. Subject matter wherein the component presents to the wave front a propagating medium whose surface offers abrupt changes in propagating characteristic.

(1) Note. These changes may result from changes in propagating material, or in length of propagating path such as a stepped formation. A mere series of parallel metal strips in an air dielectric would not be classified here, but in subclass 909, above.

911 This subclass is indented under subclass 909. Subject matter wherein the component includes in the propagating path a material having a significant dielectric characteristic.

SEE OR SEARCH THIS CLASS, SUBCLASS:

785, for solid, liquid, or gaseous dielectric wave guide type antennas.

912 This subclass is indented under subclass 907. Subject matter wherein the component constitutes a conductive structure (usually metallic) which is adapted to return or to reradiate into free space a substantial portion of the impinging radio wave energy coming from or going to an associated active antenna.

(1) Note. The reflectors or directors of this subclass are adapted for use with an active antenna associated therewith, and facilitate transmission or reception of this antenna in a desired direction. See

this Class 342, particularly subclasses 1-20 for reflectors which have no active antenna directly associated therewith, but which render their presence known by reflecting energy from and to a remote antenna.

SEE OR SEARCH THIS CLASS, SUBCLASS:

780, for pilox type antennas.
832, for an active antenna as a reflector.
833, and the search notes thereunder, for the combination of a director and active antenna.
834+, and the search notes thereunder, for the combination of a reflector and active antenna.
878+, for reflectors or directors with supports therefor.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 248+ for reflectors in wave guides.
342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 1 through 20 see (1) Note above.
359, Optics: Systems (Including Communication) and Elements, subclasses 838+ for optical mirrors and reflectors.
362, Illumination, subclasses 341+ for illumination reflectors.

913 This subclass is indented under subclass 912. Subject matter wherein the reflector or director is combined with an impedance connected or coupled to the reflector or director.

SEE OR SEARCH THIS CLASS, SUBCLASS:

722, 731+, 745+, 749+, 814, 816, 820+, and 850+, for an impedance associated with an active antenna element.
841+, for antennas with an electrical shield, which may include resistance.

914 This subclass is indented under subclass 912. Subject matter wherein different portions of the reflector or director surface have different curvatures, e.g., paraboloidal, plane, spherical or cylindrical.

915 This subclass is indented under subclass 912. Subject matter wherein the reflector or director is composed of relatively movable parts for collapsing, folding or adjusting the reflector or director; so that it may occupy a smaller space or the curvature of its surface may be changed, or its electrical characteristics may be varied.

SEE OR SEARCH THIS CLASS, SUBCLASS:

723, for single adjustable length electrically long linear antennas.
823, for adjustable length balanced doublet antennas.
868, and 871, for loop antennas of adjustable configuration and having collapsible frames, respectively.
880+, for antennas with adjustable or collapsible supports.
901+, for telescoping rod type antennas.

916 This subclass is indented under subclass 912. Subject matter wherein the reflector or director is composed of parts which may readily be assembled or disassembled.

SEE OR SEARCH THIS CLASS, SUBCLASS:

880, for antennas with a knockdown support.
915, for collapsible, foldable or adjustable reflectors or directors.

END