CLASS 361, ELECTRICITY: ELECTRICAL SYSTEMS AND DEVICES

SECTION I - CLASS DEFINITION

STATEMENT OF GENERAL SUBJECT MATTER OF CLASS

This is the residual class for:

A. Systems or devices which provide safety and protection for other systems and devices.

B. Control circuits for electromagnetic devices.

C. Control circuits for nonelectromagnetic-type relays.

D. Systems or devices which discharge, or prevent the accumulation of electrical charge on or in an object or material.

E. Circuits for charging objects or materials.

F. Systems for generating or conducting an electric charge.

G. Systems which process electrical speed signals.

H. Circuits for reversing the polarity of an electric circuit.

I. Systems which cause the ignition of a fuel or an explosive charge.

J. Systems and processes for demagnetizing a magnetic field.

K. Transformers and inductors with integral switch, capacitor or lock.

L. Electrostatic capacitors, per se.

M. Housings and mounting assemblies with plural diverse electrical components.

N. Electrolytic systems and devices.

O. Miscellaneous electrical systems and devices, which are not generic to any other class and are not provided for in any other subclass of this class.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

Many other electrical and mechanical classes provide for systems or machines which include the electrical systems and devices provided for in this class (361). The combination of the subject matter of this class (361) and an art environment is generally classified with the art environment where that environment is significant, either by virtue of a significant disclosed relationship or by virtue of a claimed relationship. Where the art environment is recited by name only (e.g., motor protective circuit), the combination may be classified, in some instances, with the art environment, and in others, in this class (361).

Whereas housings for electronic devices and components are also provided for elsewhere, Class 361 provides for housings and mounting assemblies having more than one different type of electrical component, the electrical components normally do not recite significant art limitations. (See Subclass References to the Current Class and References to Other Classes, below.)

Housings wherein (1) the housing is for an active solid state device, details of which are positively recited in the claims, or (2) where the recited housing is necessary to make a usable active solid state device whether or not the active solid state device is recited nominally or in detail are provided for elsewhere. (See References to Other Classes, below.)

However, if a housing with nominally recited active solid state devices recites different types of (active or passive) devices, then original (OR) classification is in Class 361.

Claims that recite housings with only nominal recitation of active solid state devices of only one type should be classified as originals (ORs) in neither Class 257 or Class 361, but rather in Class 174.

SECTION III - SUBCLASS REFERENCES TO THE CURRENT CLASS

SEE OR SEARCH THIS CLASS, SUBCLASS:

331+, for housings and mounting assemblies having more than one different type of electrical component; the electrical components normally do not recite significant art limitations. These subclasses also provide for combinations of housings and mounting assembles with different types of art wherein the combination is not provided for where the different art is classified.

335+, for housings and switch gear.
364+, for housings and meter structure.
381+, for housings with cooling means.

SECTION IV - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

29, Metal Working, appropriate subclasses for miscellaneous methods of manufacturing or mounting electrical or magnetic devices.

36, Boots, Shoes, and Leggings, for necessary shoe structure.

43, Fishing, Trapping, and Vermin Destroying, subclasses 98+ for electrocuting-type animal traps, and subclasses 112 for devices for electrocuting insects.

47, Plant Husbandry, subclass 1.3 for the growing of plants as affected by electricity, as, for example, to stimulate the growth or to kill the plants.

70, Locks, for locking means, per se. Note, especially subclasses 174+ for locking means for control and machine elements; subclasses 237+ for locking means for automobile vehicles.

73, Measuring and Testing, subclasses 304+ for capacitive liquid level gauges; subclasses 718 and 724 for capacitive fluid pressure gauge; subclasses 488+ for speed or accelerating measuring.

74, Machine Element or Mechanism, subclasses 10+ for the combination of a capacitor and a dial shaft operator; subclasses 395+ for systems for synchronizing the rotary motion of a plurality of shafts where adjustable gearing is utilized to control the rotation of at least one of the shafts.

84, Music, subclasses 723+ for electrical musical instruments, such as electric organs and conventional musical instruments with electrical pick-up, amplifying and reproducing means.

89, Ordnance, appropriate subclasses for explosive device projecting or dropping means having igniting means as a part thereof.

91, Motors: Expansible Chamber Type, appropriate subclasses and especially subclass 171 for synchronizing plural expansible chamber motors.

96, Gas Separation: Apparatus, subclasses 15+ for electrostatic-type precipitators.

102, Ammunition and Explosives, appropriate subclasses for explosive devices having igniting means as a portion thereof.

106, Compositions: Coating or Plastic, subclasses 1.05+ for metalizing compositions, per se.

114, Ships, subclass 240 for degaussing of ships.

116, Signals and Indicators, subclass 38 for vehicular governors indicating speed and direction; subclasses 241+ and 284+ for miscellaneous indicators for indicating the position of a variable capacitor.

118, Coating Apparatus, subclasses 621+ for electrostatic spray devices.

119, Animal Husbandry, subclass 145 for electrified station shields.

123, Internal-Combustion Engines, subclasses 143+ for igniting systems utilized with internal combustion engines; subclasses 319+ for speed regulators.

126, Stoves and Furnaces, appropriate subclasses for solid fuel burners having igniting means.

136, Batteries: Thermoelectric and Photoelectric, for electrochemical and electrothermal sources of electricity.

165, Heat Exchange, appropriate subclasses for a heat exchange structure of a general nature.

174, Electricity: Conductors and Insulators, for electric conductor and insulator structure, including conduits, boxes and housings.

177, Weighing Scales, subclasses 210+ for capacitor gauges.

178, Telegraphy, for the reproduction of pictures by a scanning procedure, as in television, facsimile and photomechanical engraving and for telegraphy, as in telautograph and teletypewriting.

180, Motor Vehicles, appropriate subclasses and see Class 361, subclass 51, search notes.

200, Electricity: Circuit Makers and Breakers, for switches and circuit breakers.

204, Chemistry: Electrical and Wave Energy, for the producing of chemical change by means of electricity, as in electrosputtering.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, for the producing of chemical change by means of electricity, as in electrolytic coating.

209, Classifying, Separating, and Assorting Solids, for electrical classifying, separating and assorting of materials and objects.

211, Supports: Racks, subclasses 41.1+ for frame structure designed to support plates or plate-like articles.

219, Electric Heating, for miscellaneous electrical heating, including welding. Note, subclass 384 for perforating sheet material by means of an electric spark.

221, Article Dispensing, subclasses 143+ for article dispensers having electrical igniting means.

222, Dispensing, for dispensing devices utilizing electromagnetic actuators.

231, Whips and Whip Apparatus, subclass 7 for a device consisting of a handle and an electrified goad for causing an electric shock to be produced in an animal to control the movement or behavior of the animal.

235, Registers, subclasses 61+ for calculators having relay-type counting chains.

236, Automatic Temperature and Humidity Regulation, appropriate subclasses for automatic temperature control systems; appropriate subclasses for complete heating systems having igniters as a portion thereof.

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 2.1, 3, and 690+ respectively, for methods and apparatus for projecting a liquid into the air and including a provision for imparting an electrostatic charge to the projected liquid. See the notes to these subclasses for a statement of the line.

244, Aeronautics, subclass 1 for aircraft lightning arresters and static eliminators.

246, Railway Switches and Signals, appropriate subclasses for electrical control of railway switches and signals.

250, Radiant Energy, for radio and microwave absorption meters, the detection of the nuclear or electromagnetic energy, the testing of materials by nuclear or electromagnetic energy, mass spectroscopy, fluorescent and phosphorescent applications, electron or ion beam deflection or focusing ion generation, supports for fluent material or objects, the irradiation of material or objects, nuclear and electromagnetic radiation detectors, radiant energy generators and sources, radiation controlling means, and radiation source and detector supports.

252, Compositions, subclasses 512+ for electrically conductive metal-containing compositions; subclass 567 for a web or sheet impregnated with a defined dielectric liquid; and subclasses 570+ for a fluent dielectric, per se.

256, Fences, subclass 10 for electric fences.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se. Class 257 provides for housings wherein (1) the housing is for an active solid state device, details of which are positively recited in the claims, or (2) where the recited housing is necessary to make a usable active solid state device whether or not the active solid state device is recited nominally or in detail. (Lines With Other Classes and Within This Class, above.)

290, Prime-Mover Dynamo Plants, for electric generating plants.

303, Fluid-Pressure and Analogous Brake System, subclasses 113.1+ for antiskid systems where brakes are operated.

307, Electrical Transmission or Interconnection Systems, for systems of distributing electricity or interconnection. The line between Class 307 and this class (361) can be determined only by consulting the art to be found in these two classes.

310, Electrical Generator or Motor Structure, subclass 90.5 for magnetic supports.

312, Supports: Cabinet Structure, subclasses 294+ for supports and cabinets with movable components.

313, Electric Lamp and Discharge Devices, for electric lamps, vacuum tubes, gas discharge tubes and spark gaps.

314, Electric Lamp and Discharge Devices: Consumable Electrodes, for arc lamps.

315, Electric Lamp and Discharge Devices: Systems, for cathode-ray tube circuits, gas tube circuits, electric lamp circuits, and circuits which are integral with a discharge device or lamp.

318, Electricity: Motive Power Systems, for electric motor systems, including servo-motor systems.

320, Electricity: Battery or Capacitor Charging or Discharging, for a method or apparatus for charging or discharging a battery or capacitor.

322, Electricity: Single Generator Systems, for systems for controlling a single generator and its prime mover.

323, Electricity: Power Supply or Regulation Systems, for systems for controlling the voltage of electricity and the phase of alternating currents.

324, Electricity: Measuring and Testing, for electrical measuring, testing and sensing, such as, for example, the determination of moisture in material by measuring its resistivity and the measuring of power in an electric circuit.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous active device circuits.

329, Demodulators, subclasses 311+ for pulse demodulators which may include radiation reduction.

330, Amplifiers, appropriate subclasses for amplifier systems.

331, Oscillators, appropriate subclasses for self-sustaining electric wave generators of the nondynamoelectric type.

332, Modulators, for systems for modulating an intelligence upon a repetitious wave.

333, Wave Transmission Lines and Networks, appropriate subclasses for the subject matter of that class.

334, Tuners, appropriate subclasses for tuned networks used in wave energy apparatus, tuners with shielding means, and switch operated tuners.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, for electromagnets with armatures, switches or magnetic chuck structure.

336, Inductor Devices, for transformers and inductances.

337, Electricity: Electrothermally or Thermally Actuated Switches, appropriate subclasses for thermal-type circuit breakers, per se.

338, Electrical Resistors, appropriate subclasses for electrical resistors both of the linear and nonlinear types.

340, Communications: Electrical, appropriate subclasses for miscellaneous electrical signalling.

343, Communications: Radio Wave, for radar and directive radio systems and antennas.

352, Optics: Motion Pictures, for motion picture apparatus combined with sound recording or reproducing apparatus, including means for synchronizing the two.

362, Illumination, for electric lights and photographic illumination devices including ignition means.

363, Electric Power Conversion Systems, in which electricity is converted from one form to another as from direct current to alternating.

368, Horology: Time Measuring Systems or Devices, subclass 293 for antimagnetic devices used in horology.

369, Dynamic Information Storage or Retrieval, subclasses 72+ for storage medium electrostatic charge neutralization; and subclass 126 for information storage by dynamic electrostatic charge.

375, Pulse or Digital Communications, for pulse communication equipment.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 100+ for processes and devices for electrically and/or magnetically confining and controlling a plasma to yield nuclear fusion reactions.

378, X-Ray or Gamma Ray Systems or Devices, for X-ray or gamma ray systems or devices.

379, Telephonic Communications, for telephone systems and subcombinations.

396, Photography, subclasses 155+ for photoflash devices combined with camera structure which may include ignition means.

399, Electrophotography, subclass 37 for diagnostics of power supplied to an electrophotographic device, subclasses 88+ for machine operations with power supply, and subclasses 168+ for charging a photoconductive member.

416, Fluid Reaction Surfaces (i.e., Impellers), appropriate subclasses for centrifugal or impeller rotation speed responsive systems.

420, Alloys or Metallic Compositions, for alloys, per se.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 21, 22+, and 186 for process and apparatus provided by the class using electrical energy.

427, Coating Processes, subclasses 458+ for processes of coating, per se, utilizing an electrostatic charge; subclasses 79+ for processes of coating utilized in making capacitors.

431, Combustion, subclass 128 for hand manipulatable electric igniters for igniting fuel.

439, Electrical Connectors, for electrical connectors.

454, Ventilation, appropriate subclasses for ventilating devices.

455, Telecommunications, for receivers, transmitters and miscellaneous apparatus.

463, Amusement Devices: Games, subclass 47.3 for a striking type of weapon for use on a human being which includes an electric shock feature (e.g., an electric prod used by police, etc.).

505, Superconductor Technology: Apparatus, Material, Process, subclasses 150+ for high temperature (T_c 30 K) superconducting systems or devices, and subclasses 800+ for cross-reference art collections on superconductive systems or devices.

600, Surgery, subclasses 9+ for application of a magnetic field to a body for therapy.

602, Surgery: Splint, Brace, or Bandage, subclass 2,for a bandage including electrical application to a body.

606, Surgery, especially subclasses 32+, for electrical application to a body for surgical purposes.

607, Surgery: Light, Thermal, and Electrical Application, subclasses 1+ for devices for applying electricity to the human body.

SUBCLASSES

1 SAFETY AND PROTECTION OF SYSTEMS AND DEVICES:

This subclass is indented under the class definition. Subject matter relating to the safety and protection of electrical systems and devices which include either fault sensing means which activate a protective means to remove a fault condition or a protective means which detects and removes the fault condition.

(1) Note. This and indented subclasses do not include, as a portion thereof, the protection and safety of human beings in the vicinity of electrical apparatus. Generally, the excluded protection and safety systems are classified in the subclass which relates to the environment in which the protected human being may be found. Thus, for example, electrical conductors having grounded guarding means to protect human personnel are classified as electric conductors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

600+, for switchboards and analogous devices, such as housings, some of which act as protective means.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 2+ for lightning protection systems consisting only of conductors and insulators, subclass 5 for electric shock hazard protective devices for protecting personnel, subclass 6 for earth ground, per se, and subclass 11 for electric conductor structure having means automatically responsive to the condition of the fluid which is associated with the electric conductors.

178, Telegraphy, subclass 69 for telegraph line clearing and circuit maintenance systems.

307, Electrical Transmission or Interconnection Systems, subclasses 326+ for safety or limit control features.

314, Electric Lamp and Discharge Devices: Consumable Electrodes, subclasses 10+ for arc lamp systems having an automatic shunt or cutout.

315, Electric Lamp and Discharge Devices: Systems, subclasses 88+, especially subclass 91 for lamp and space discharge device systems having means to automatically substitute another lamp, space discharge devices, or electrode for the previous one under certain conditions of operation, subclasses 119+ for lamp and space discharge systems having an automatic shunt or cutout, and subclass 209 for lamp and space discharge device systems having periodic switch means in the supply circuit.

318, Electricity: Motive Power Systems, subclass 434 for electric motor systems where the motor is significantly claimed having means to limit the motor load current, torque or force, as for the purpose of limiting an overload.

323, Electricity: Power Supply or Regulation Systems, subclass 267 for condition sensing regulators with protection.

324, Electricity: Measuring and Testing, subclass 110 for electric meter protection against electrical hazards and against the hazard of fraud.

330, Amplifiers, subclasses 250+ for semiconductor amplifiers.

331, Oscillators, subclass 62 for oscillators provided with oscillator circuit protective means, and subclass 63 for oscillator systems provided with protection or safety devices for personnel.

340, Communications: Electrical, subclasses 635+ for electrical apparatus condition responsive signalling

devices, particularly subclasses 649, 650, and 652 for grounding circuit, undesired circuit ground, and open circuit, condition responsive signalling devices, respectively.

363, Electric Power Conversion Systems, subclasses 50+ for conversion systems having protective means.

379, Telephonic Communications, subclass 437 for telephone systems having protective means.

2 Arc suppression at switching point (i.e., includes solid-state switch):

This subclass is indented under subclass 1. Subject matter for preventing or extinguishing arcs at the main switching points of the switching device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

159, for arc suppression in control circuits for electromagnetic devices.

SEE OR SEARCH CLASS:

218, High-Voltage Switches With Arc Preventing and Extinguishing Devices, subclasses 1+ for switches having arc preventing and extinguishing features.

333, Wave Transmission Lines and Networks, subclasses 19 and 20 for differentiating, integrating and wave shaping networks, some of which can be used to prevent a rapid rise of voltage when a switching contact is opened.

363, Electric Power Conversion Systems, subclasses 106+ and 177 for circuit-interrupter-type conversion systems which are usually provided with arc suppression or reducing means.

3 Synchronized or sequential opening or closing:

This subclass is indented under subclass 2. Subject matter with means to open or close the switch at a predetermined time or in a predetermined sequence.

SEE OR SEARCH CLASS:

323, Electricity: Power Supply or Regulation Systems, subclasses 238 and 321.

4 Counter electromotive force:

This subclass is indented under subclass 3. Subject matter with means for inserting an opposing voltage or current across the switching points to effectively cancel the arc producing surge.

5 With current sensitive control circuit:

This subclass is indented under subclass 3. Subject matter wherein the opening or closing control circuit is responsive to the in-line current. The in-line current is that which is switched at the main switching point.

SEE OR SEARCH THIS CLASS, SUBCLASS:

31, and 32, for current responsive control circuitry in motor shunting circuits.

57, for current responsive control circuitry in load shunting circuits.

63+, for current responsive control circuitry in feeder distribution networks.

87, for current responsive control circuitry in quantity comparison circuits.

93.1+, for current responsive fault sensors.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 131 for current responsive switching systems.

340, Communications: Electrical, subclass 664 for current characteristic actuated (e.g., line fault).

6 With voltage sensitive control circuit:

This subclass is indented under subclass 3. Subject matter wherein the opening or closing control circuit is responsive to the line voltage. The line voltage is that which is switched at the main switching points.

SEE OR SEARCH THIS CLASS, SUBCLASS:

21, for voltage responsive control circuits in generator protective systems.

33+, for voltage responsive control circuits in motor protective systems.

56, for voltage responsive control circuits in load shunting systems.

86, for voltage responsive control circuits in quantity comparison circuits.

88+, for voltage responsive fault sensors.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclass 130 for voltage responsive switching circuits.
340, Communications: Electrical, subclasses 660+ for voltage responsive signalling means.

7 With combined voltage and current sensitive control circuit:
This subclass is indented under subclass 3. Subject matter wherein the opening or closing control circuit is responsive to both the in-line current and the line voltage.

SEE OR SEARCH THIS CLASS, SUBCLASS:
30, for combined voltage and current sensitive control circuits in motor protection circuits.
65+, for combined voltage and current sensitive control circuits in feeder distribution networks.
79+, for combined voltage and current sensitive control circuits in quantity comparison circuits.

SEE OR SEARCH CLASS:
322, Electricity: Single Generator Systems, subclass 25 for voltage and current responsive means for generator control circuits.

8 Shunt bypass:
This subclass is indented under subclass 3. Subject matter including a circuit in parallel with the main line switching points to drain away the arc causing surge.

SEE OR SEARCH THIS CLASS, SUBCLASS:
9, for shunt bypass of main switch with sequentially inserted impedance.
13, for nonsynchronized shunt bypass.

9 With sequentially inserted impedance:
This subclass is indented under subclass 8. Subject matter which includes means to increase the shunt impedance in a predetermined manner.

10 By inserting series impedance:
This subclass is indented under subclass 2. Subject matter with means to place an impedance in-line with the main switching points to suppress the arc causing surge.

SEE OR SEARCH THIS CLASS, SUBCLASS:
58, for impedance insertion in general.

SEE OR SEARCH CLASS:
218, High-Voltage Switches With Arc Preventing and Extinguishing Devices, subclasses 1+ and 143+ for switches having arc preventing and extinguishing features with resistance insertion.

11 Nonlinear impedance:
This subclass is indented under subclass 10. Subject matter with means to insert a nonlinear impedance (inductors, capacitors, thermistors, etc.) in series with the main switching points to suppress the arc causing surge.

12 By arc stretching (e.g., horn gap):
This subclass is indented under subclass 10. Subject matter wherein the lengthening of the arc effectively inserts an increasing amount of impedance in series with the switching points.

SEE OR SEARCH THIS CLASS, SUBCLASS:
137+, for this subject matter in high voltage applications.

13 Shunt bypass of main switch:
This subclass is indented under subclass 2. Subject matter with a current path around the main line switching points to drain away the arc causing surge.

SEE OR SEARCH THIS CLASS, SUBCLASS:
8, for synchronized shunt bypass circuits.
54+, for load shunting where the load is not a switch.

SEE OR SEARCH CLASS:
218, High-Voltage Switches With Arc Preventing and Extinguishing Devices, subclasses 8+ for arc preventing and extinguishing with auxiliary shunt.

14 Arc blowout for main breaker contact (e.g., electromagnet, gas, fluid, etc.):
This subclass is indented under subclass 2. Subject matter with means to extinguish the arc in a dynamic manner effectively increasing the length of the path of the arc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
123, 133, 134, 135, and 137+, for this subject matter in high voltage applications.

SEE OR SEARCH CLASS:
218, High-Voltage Switches With Arc Preventing and Extinguishing Devices, subclasses 22+ for arc preventing and extinguishing with magnetic blowout.

15 Capacitor protection:
This subclass is indented under subclass 1. Subject matter for protecting capacitors from damage caused by excess heat and voltage or current surges.

(1) Note. The protective systems and devices included in this subclass are external to the capacitor housing and details to the capacitor structure are not included.

SEE OR SEARCH THIS CLASS, SUBCLASS:
272+, for capacitors, per se, wherein the protective device is an integral part of the capacitor structure and details to the capacitor structure are included.

16 Series connected capacitors:
This subclass is indented under subclass 15. Subject matter for preventing damage to in-line capacitors.

17 Shunt connected capacitors:
This subclass is indented under subclass 15. Subject matter for preventing damage to capacitors connected in parallel with the source or load.

SEE OR SEARCH THIS CLASS, SUBCLASS:
272+, for electrostatic capacitors with protection or compensating means.

18 Voltage regulator protective circuits:
This subclass is indented under subclass 1. Subject matter wherein the fault sensing means for a voltage regulator system activates a protective means which interrupts the power to the load.

SEE OR SEARCH CLASS:
323, Electricity: Power Supply or Regulation Systems, subclass 276 for voltage regulator systems wherein the current flow to the load is limited (not interrupted).

19 Superconductor protective circuits:
This subclass is indented under subclass 1. Subject matter comprising means for electrically preventing damage to a superconductor circuit or device.

SEE OR SEARCH CLASS:
327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 366+ for superconductor gating circuits and subclasses 527+ for miscellaneous superconductor circuits.
505, Superconductor Technology: Apparatus, Material, Process, particularly subclasses 150+ for high temperature (T_c 30 K) superconducting systems or devices, subclass 192 for capacitors having high temperature superconducting materials, and cross-reference art collections in subclass 850 for protective circuits for electromagnetic devices that are superconductive.

20 Generator protective circuits:
This subclass is indented under subclass 1. Subject matter comprising means for electrically preventing damage to a generator.

SEE OR SEARCH CLASS:
322, Electricity: Single Generator Systems, for generator control circuits when the generator is significantly claimed.

21 Voltage responsive:
This subclass is indented under subclass 20. Subject matter wherein a fault sensor responds to an abnormal voltage condition in either the load circuit or the generator field circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
6, for voltage responsive control means in arc suppression circuits.
33, for voltage responsive control circuits in motor protective systems.
56, for voltage responsive control circuits in load shunting systems.
86, for voltage responsive control circuits in quantity comparison circuits.
88+, for voltage responsive fault sensors.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 635+ for electrical apparatus condition responsive signalling device.

22 Compressor protective circuits:
This subclass is indented under subclass 1. Subject matter comprising means for electrically preventing damage to a compressor.

SEE OR SEARCH CLASS:
318, Electricity: Motive Power Systems, for general control circuits when the compressor is significantly claimed.

23 Motor protective condition responsive circuits:
This subclass is indented under subclass 1. Subject matter including means to sense an abnormal condition or change of condition of a motor or its circuitry and to remove the fault condition.

SEE OR SEARCH CLASS:
318, Electricity: Motive Power Systems, for motor control circuits when the motor is significantly claimed.
340, Communications: Electrical, subclass 648 for a motor condition responsive signalling device.

24 Current and temperature:
This subclass is indented under subclass 23. Subject matter wherein the sensing means is responsive to an abnormal current and temperature condition.

25 Motor temperature:
This subclass is indented under subclass 23. Subject matter wherein the sensing means is located in the immediate proximity with the motor and is responsive to an abnormal temperature condition of the motor.

SEE OR SEARCH THIS CLASS, SUBCLASS:
37, for related subject matter in transformer systems.
103+, for general thermal sensing circuits.

SEE OR SEARCH CLASS:
318, Electricity: Motive Power Systems, subclasses 471+ for related subject matter in motor control systems.

26 With bimetallic sensor:
This subclass is indented under subclass 25. Subject matter wherein sensing device is bimetallic.

27 With thermistor sensor:
This subclass is indented under subclass 25. Subject matter wherein the sensing device is a resistor whose characteristics vary with temperature in a definite manner.

28 With time delay:
This subclass is indented under subclass 23. Subject matter wherein the protective circuit responds to a fault condition only after a predetermined time.

SEE OR SEARCH THIS CLASS, SUBCLASS:
89, for time delay circuits combined with voltage responsive sensor.
94, for time delay circuits combined with current responsive sensor.
195+, and 202, for time delay circuits in control systems for relays and solenoids.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 141 for time delay circuits in switching circuits.

29 During energization of motor:

This subclass is indented under subclass 28. Subject matter wherein time delay means are provided for maintaining the protective circuit in an off condition during normal start-up.

SEE OR SEARCH THIS CLASS, SUBCLASS:

110, for transient nonresponsive circuits which ignores the surges on a transmission line.

30 Current and voltage:

This subclass is indented under subclass 23. Subject matter wherein the sensing means is responsive to an abnormal current and voltage condition of the protected motor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

7, for current and voltage sensitive control circuits in arc suppression circuits.

65, for current or voltage sensing means in feeder circuits.

79+, for current or voltage sensing means in quantity comparison circuits.

31 Current:

This subclass is indented under subclass 23. Subject matter wherein the sensing means is responsive to an abnormal current condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, for current responsive control circuits in arc suppression circuits.

57, for current sensing means in load shunting circuits.

63+, for current sensing means in feeder circuits.

87, for current sensing means in quantity comparison circuits.

93.1+, for specific current responsive sensors.

32 Bimetallic element:

This subclass is indented under subclass 31. Subject matter wherein the sensing means consist of bimetallic material.

33 Voltage:

This subclass is indented under subclass 23. Subject matter wherein the sensing means is responsive to an abnormal voltage condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

6, for voltage sensitive control means in arc suppression circuits.

21, for voltage sensing means in generator circuits.

56, for voltage sensing means in shunt circuits.

86, for voltage sensing means in quantity comparison circuits.

88+, for specific voltage responsive sensor.

34 Bimetallic element:

This subclass is indented under subclass 33. Subject matter wherein the sensing means consist of bimetallic material.

35 Transformer protection:

This subclass is indented under subclass 1. Subject matter comprising means for preventing damage to a transformer.

SEE OR SEARCH CLASS:

323, Electricity: Power Supply or Regulation Systems, subclasses 215, 247, 301, 305, 328, and 355 for transformer systems.

336, Inductor Devices, for transformer, per se.

340, Communication: Electrical, subclass 646 for transformer condition responsive indicating means.

36 With differential sensing means:

This subclass is indented under subclass 35. Subject matter including means which compare the electrical quantities entering and leaving the transformer.

SEE OR SEARCH THIS CLASS, SUBCLASS:

60, for differential voltage comparison across the circuit interrupting means.

78, for specific quantity comparison means.

37 With temperature or pressure sensing means:
This subclass is indented under subclass 35. Subject matter including means responsive to an abnormal temperature or pressure caused by a fault condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
25, for temperature sensing means in motor systems.
103+, for general circuit interruption by thermal sensing means.

38 Transformer with structurally combined protective device:
This subclass is indented under subclass 35. Subject matter wherein the protective means is an integral part of the transformer structure or housing.

39 With lightning arrester and fuse:
This subclass is indented under subclass 38. Subject matter wherein the protecting device includes means to shunt voltage surges away from a transformer and means to open the circuit to the transformer when the current exceeds the maximum rated value of the protected device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
117+, for lightning arrester combined with fuse.

40 With lightning arrester (e.g., spark gap):
This subclass is indented under subclass 38. Subject matter which shunts voltage surges away from a transformer.

SEE OR SEARCH THIS CLASS, SUBCLASS:
117+, for high voltage dissipation (lightning arresters), per se.

41 With fuse:
This subclass is indented under subclass 38. Subject matter which opens the circuit to the transformer when the current exceeds the maximum rated value of the protected device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
104, for circuit interruption by thermal sensing (fuse).

42 Ground fault protection:
This subclass is indented under subclass 1. Subject matter with means for sensing ground faults and for preventing damage to a system or device due to the ground fault.

(1) Note. A ground fault is a defect in a wire circuit due to unintentional grounding.

SEE OR SEARCH THIS CLASS, SUBCLASS:
107+, for specific transmission line with ground conductor.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 650+ for ground detectors with indicator only.

43 Fault suppression (e.g., petersen coil):
This subclass is indented under subclass 42. Subject matter wherein a protective circuit substantially reduces the ground leakage current.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclasses 326+ for safety or limit control features.

44 With differential sensing in a polyphase system:
This subclass is indented under subclass 42. Subject matter wherein the current going to and returning from the load in a polyphase system is compared by a sensing means and a sensed difference activates the protective circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
78, for specific quantity comparison means.

45 With differential sensing in a single phase system:
This subclass is indented under subclass 42. Subject matter wherein the current going to and returning from the load in a single phase system is compared by a sensing means and a

sensed difference activates the protective circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
78, for specific quantity comparison means.

46 With more than two wires:
This subclass is indented under subclass 45. Subject matter wherein the current going to and returning from the load in a single phase system with more than two wires is compared by a sensing means and a sensed difference activates the protective circuit.

47 In a polyphase system:
This subclass is indented under subclass 42. Subject matter wherein the load in a polyphase system is protected from an unintentional grounding usually by removing the power from the load when a ground fault is detected by a sensing means.

48 With more than three wires:
This subclass is indented under subclass 47. Subject matter wherein the polyphase system comprises more than three wires (e.g., a grounded wye-polyphase with a neutral conductor).

SEE OR SEARCH THIS CLASS, SUBCLASS:
108, for related subject matter with specific transmission line.

49 In a single phase system:
This subclass is indented under subclass 42. Subject matter wherein the load in a single phase system is protected from an unintentional grounding, usually by removing the power from the load, when a ground fault is detected by a sensing means.

50 With more than two wires:
This subclass is indented under subclass 49. Subject matter wherein the load in a single phase system with more than two wires is protected from an unintentional grounding, usually be removing the power from the load when a ground fault is detected by a sensing means.

51 Overspeed responsive:
This subclass is indented under subclass 1. Subject matter wherein the load is protected from an excessive speed condition by means which detects the abnormal condition and activates a protective circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
236, for electrical speed signal processing systems.

SEE OR SEARCH CLASS:
180, Motor Vehicles, subclasses 170+ for a motor vehicle provided with means responsive to the speed of the vehicle for maintaining the speed at or preventing it from exceeding a particular or value.

52 By regulating source or load (e.g., generator field killed):
This subclass is indented under subclass 1. Subject matter wherein means are provided to stabilize the power to the load.

(1) Note. The generator supplying the voltage may, for example, have its field killed when a short circuit develops.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclass 153 for miscellaneous generator control systems.
322, Electricity: Single Generator Systems, subclasses 17+ for automatically controlled single generator systems, and subclasses 69+ for circuit interruption type of generator control.
323, Electricity: Power Supply or Regulation Systems, subclass 234 for miscellaneous systems of load control.

53 Prime mover control:
This subclass is indented under subclass 52. Subject matter wherein the driving means for the source is controlled.

54 Load shunting by fault responsive means (e.g., crowbar circuit):
This subclass is indented under subclass 1. Subject matter wherein the load is protected from an overload condition by a fault sensing means which senses the overload condition and causes the load to be bypassed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
13, for switch shunting.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclass 100 for shunting or short circuiting systems.
315, Electric Lamp and Discharge Devices: Systems, subclasses 119+ for circuits with automatic shunt or cutout.

55 Disconnect after shunting:
This subclass is indented under subclass 54. Subject matter wherein the circuit to the load is opened after the overload condition is shunted from the load.

56 Voltage responsive:
This subclass is indented under subclass 54. Subject matter wherein the fault sensing means is sensitive to an abnormal voltage condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
6, for voltage sensitive control means in arc suppression circuits.
21, for voltage sensing means in generator circuits.
33+, for voltage responsive control circuits in motor protective circuits.
86, for voltage sensing means in quantity comparison circuits.
88+, for specific voltage responsive sensor.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 635+ for electrical apparatus condition responsive.

57 Current responsive:
This subclass is indented under subclass 54. Subject matter wherein the fault sensing means is sensitive to an abnormal current condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
5, for current responsive control circuits in arc suppression circuits.
31+, for current responsive control circuitry in motor protective circuits.
63+, for current sensing means in feeder circuits.
87, for current responsive control circuitry in quantity comparison circuits.
93.1+, for current responsive fault sensors.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclass 664 for current characteristic actuated circuits in condition responsive systems.

58 Impedance insertion:
This subclass is indented under subclass 1. Subject matter wherein an impedance is placed in series with the protected device or system to limit the current thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:
10+, for impedance insertion in series with switching points.

SEE OR SEARCH CLASS:
323, Electricity: Power Supply or Regulation Systems, subclass 276 for limiting current to the load in regulator system.

59 Circuit automatically reconnected only after the fault is cleared:
This subclass is indented under subclass 1. Subject matter wherein fault sensing means activates the circuit disconnect means when a fault occurs and the circuit is caused to remain open until the fault is removed. Once the fault is removed the circuit is automatically reclosed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
86+, for automatic reclosing, per se.

60 With differential voltage comparison across the circuit interrupting means:
This subclass is indented under subclass 59. Subject matter wherein the voltage across the circuit disconnect means is sensed on both sides of the disconnect means and compared to determine if the fault has been removed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
86, for voltage quantity comparison circuits.

61 Reclosing of the nonfaulty phases of a polyphase system:
This subclass is indented under subclass 59. Subject matter wherein all phases of a polyphase system are opened due to a fault, and the nonfaulty phases are subsequently automatically reconnected.

62 Feeder protection in distribution networks:
This subclass is indented under subclass 1. Subject matter wherein the system which distributes power from a source (normally a bus) to the load is protected from a fault condition by disconnection.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclass 26 for plural diverse sources of supply, A.C. and D.C.

63 With current responsive fault sensor:
This subclass is indented under subclass 62. Subject matter wherein the protective means senses a current fault in the feeder and activates the disconnect means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
5, for current responsive control circuits in arc suppression circuits.
31, for current responsive control circuitry in motor protective circuits.
57, for current responsive control circuitry in load shunting circuits.
87, for current responsive control circuitry in quantity comparison circuits.
93.1+, for current responsive fault sensors.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 650+ for circuit fault responsive circuits in condition responsive systems.

64 With communication between feeder disconnect points:
This subclass is indented under subclass 63. Subject matter wherein the current sensing means activates a communication means which sends a coded message to adjacent feeder disconnect points indicating the location of the fault.

SEE OR SEARCH THIS CLASS, SUBCLASS:
68+, for communication circuits in series connected sections.
81, for communication circuits in distance relay systems.

65 With current and voltage responsive fault sensors:
This subclass is indented under subclass 62. Subject matter wherein the fault sensing means detects both current and voltage in the feeder and activates the disconnect means when a fault is sensed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
7, for combined voltage and current sensitive control circuits in arc suppression systems.
30, for combined voltage and current sensitive control circuits in motor protection circuits.
79, for combined voltage and current sensitive control circuits in quantity comparison circuits.

66 With communication between feeder disconnect points:
This subclass is indented under subclass 65. Subject matter wherein the sensing means activates a communication means which sends a coded message to adjacent feeder disconnect points indicating the location of the fault.

SEE OR SEARCH THIS CLASS, SUBCLASS:

68+, for communication circuits in series connected sections.

81, for communication circuits in distance relay systems.

67 Series connected sections with faulty section disconnect:

This subclass is indented under subclass 1. Subject matter wherein the system which distributes power (normally a bus network) has series connected sections and is protected from a fault condition by disconnecting the faulty section.

68 With communication between disconnect points:

This subclass is indented under subclass 67. Subject matter wherein communications means sends a coded message between disconnect points indicating that a fault exists.

(1) Note. Some of the most commonly used communication systems are: Current Carrier Systems; Radio Wave Transmitter-Receiver Systems; and Laser Transmitter-Receiver Systems.

SEE OR SEARCH THIS CLASS, SUBCLASS:

64, and 66, for communication circuits in feeder networks.

81, for communication circuits in quantity comparison systems (distance relaying).

69 Pilot wire communication:

This subclass is indented under subclass 68. Subject matter wherein the signal between disconnect points is communicated over pilot wire.

70 Constant current system:

This subclass is indented under subclass 67. Subject matter wherein current regulators are used in the system.

SEE OR SEARCH CLASS:

323, Electricity: Power Supply or Regulation Systems, subclass 234 for constant current systems.

71 Automatic reclosing:

This subclass is indented under subclass 1. Subject matter in which the system is automatically restored to normal operation subsequent to a disconnect operation caused by a fault condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

59+, for automatic reclosing after clearing of fault.

SEE OR SEARCH CLASS:

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 6+ for automatic circuit interrupting devices, per se.

72 With lockout means:

This subclass is indented under subclass 71. Subject matter wherein the reclosing means (normally a circuit breaker) discontinues to reclose after a predetermined number of reclosings and remains in the open mode.

73 Including timer reset before lockout:

This subclass is indented under subclass 72. Subject matter wherein timer means is reset if the fault dissipates prior to a predetermined number of reclosings.

74 Continuous:

This subclass is indented under subclass 71. Subject matter wherein the system is continuously reconnected after each disconnect operation, although the fault has not been cleared.

75 With time delay before reclosing:

This subclass is indented under subclass 74. Subject matter wherein the system is restored to normal operation after a predetermined time following each disconnect operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

28, for time delay circuits in motor protection systems.

89, for time delay circuits in voltage responsive systems.

94+, for time delay circuits in current responsive systems.

195+, for time delay circuits in relay and solenoid systems.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclass 141 for time delay circuits in switching systems.

76 With phase sequence network analyzer:
This subclass is indented under subclass 1. Subject matter relating to systems which are responsive to either one or more of the positive, negative or zero sequence components of electricity in a polyphase system.

SEE OR SEARCH THIS CLASS, SUBCLASS:
77, for reverse phase responsive sensing.
85, for quantity comparison to determine a phase fault.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclasses 107+ for similar subject matter but not protective.

77 Reverse phase responsive:
This subclass is indented under subclass 1. Subject matter relating to systems responsive to a 180° change of phase and also systems responsive to an improper phase sequence.

(1) Note. This subclass relates, for example, to systems responsive to a 180° change of phase and also systems responsive to an improper phase sequence, as for example, when Conductors A, B, and C are connected respectively to phases I, III, II, rather than phases I, II, III.

SEE OR SEARCH THIS CLASS, SUBCLASS:
76, for phase sequence sensing.
85, for quantity comparison to determine a phase fault.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclass 127 for polarity, phase sequence or reverse flow responsive switching systems.

78 With specific quantity comparison means:
This subclass is indented under subclass 1. Subject matter wherein a specific electrical quantity (voltage, current, etc.) is sensed in the load circuit and compared with either a reference quantity of the same type or another specific electrical quantity to determine if a fault condition exists. The protective circuitry is activated when a difference in the magnitudes of the compared quantities is found to exist.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclass 661 for a voltage comparison condition responsive indicating device.

79 Voltage and current:
This subclass is indented under subclass 78. Subject matter wherein the fault sensor is responsive to abnormal voltage and current conditions in the load circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
30, for combined voltage and current sensitive control circuits in motor protection systems.
65, for combined voltage and current sensitive control circuits in feeder distribution networks.

80 Distance relaying:
This subclass is indented under subclass 79. Subject matter wherein the voltages and currents are sensed at specific points in a system and computed with each other or with reference quantities to determine if a fault condition exists in the protected line section.

SEE OR SEARCH THIS CLASS, SUBCLASS:
67+, for distance relaying circuits in series connected sections.

81 With communication means between disconnect points:
This subclass is indented under subclass 80. Subject matter wherein a communication means sends a coded message between disconnect points indicating that a fault condition exists.

SEE OR SEARCH THIS CLASS, SUBCLASS:

64, and 66, for communication circuits in feeder networks.

68+, for communication circuits in series connected sections.

82 Reverse energy responsive (e.g., directional):

This subclass is indented under subclass 79. Subject matter wherein the fault sensing means responds to the flow of energy which is reversed with respect to the normal direction of flow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

84, for similar subject matter wherein the quantities compared are not specifically voltage and current.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 127 for polarity, phase sequence or reverse flow responsive switching systems.

83 With time delay protective means:

This subclass is indented under subclass 79. Subject matter wherein the protective means is activated at a predetermined time after a fault is sensed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

28, for time delay circuits in motor protection systems.

75, for time delay means in automatic reclosing systems.

89, for time delay circuits in voltage responsive systems.

94, for time delay circuits in current responsive systems.

195+, for time delay circuits in relay and solenoid systems.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 141 for time delay circuits in switching circuits.

84 Reverse energy responsive (e.g., directional):

This subclass is indented under subclass 78. Subject matter wherein the fault sensing means responds to the flow of energy which is reversed with respect to the normal direction of flow.

SEE OR SEARCH THIS CLASS, SUBCLASS:

82, for similar subject matter wherein the quantities compared are specifically voltage and current.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 127 for polarity, phase sequence or reverse flow responsive switching systems.

85 Phase:

This subclass is indented under subclass 78. Subject matter wherein the protective circuitry is activated by a difference in the phases of the compared electrical quantities.

SEE OR SEARCH THIS CLASS, SUBCLASS:

76, for phase sequence sensing to determine a fault.

77, for reverse phase responsive sensing.

SEE OR SEARCH CLASS:

324, Electricity: Measuring and Testing, subclasses 76.77+ for phase comparison circuits.

86 Voltage:

This subclass is indented under subclass 78. Subject matter wherein the protective circuitry is activated by a difference in the compared circuits.

SEE OR SEARCH THIS CLASS, SUBCLASS:

6, for voltage sensitive control means in arc suppression circuits.

21, for voltage responsive control circuits in generator protective systems.

33+, for voltage responsive control circuits in motor protective systems.

56, for voltage responsive control circuits in load shunting systems.

88+, for voltage responsive fault sensors.

87 Current:
This subclass is indented under subclass 78. Subject matter wherein the protective circuitry is activated by a difference in the compared currents.

SEE OR SEARCH THIS CLASS, SUBCLASS:
5, for current sensing means in arc suppression circuits.
31+, for current responsive control circuitry in motor protective circuits.
57, for current sensing means in load shunting circuits.
63+, for current sensing means in feeder circuits.
93.1+, for specific current responsive sensors.

88 With specific voltage responsive fault sensor:
This subclass is indented under subclass 1. Subject matter wherein the fault sensor responds to an abnormal voltage condition in the load circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
6, for voltage sensitive control means in arc suppression circuits.
21, for voltage responsive control circuits in generator protective systems.
32, for voltage responsive control circuits in motor protective circuits.
56, for voltage responsive control circuits in load shunting systems.
86, for voltage responsive control circuits in quantity comparison circuits.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 635+ for electrical apparatus condition responsive indicating means.

89 With time delay protective means:
This subclass is indented under subclass 88. Subject matter wherein the protective means is activated at a predetermined time after the fault is sensed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
195+, for time delay circuits in relay and solenoid systems.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclass 141 for time delay circuits in switching system.
327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 261+ and 392+ for miscellaneous delay circuits.

90 Overvoltage and undervoltage:
This subclass is indented under subclass 88. Subject matter wherein the fault sensor is responsive to a combined overvoltage and undervoltage condition.

91.1 Overvoltage:
This subclass is indented under subclass 88. Subject matter wherein the fault sensor is responsive to an overvoltage condition.

(1) Note. This subclass relates to protection involving overvoltage conditions which are considered to be fault conditions and not otherwise. Fault conditions are defined as those which could result in damage to the load circuit, if ignored, but do not include electrostatic discharge (ESD) event.

(2) Note. For ESD event protection, see Class 361, subclass 56.

SEE OR SEARCH THIS CLASS, SUBCLASS:
18, for voltage regulation by sensing overvoltage conditions.
33, for sensing abnormal voltage conditions in motor circuits.
56, for load shunting by sensing an abnormal voltage condition.
111, for protection from transient overvoltage conditions.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices, (e.g., Transistors, Solid-State Diodes), subclass 173 for device protection from overvoltage.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 20 for automatically response to abnormal voltage condition.

340, Communications: Electrical, subclass 662 for humanly perceptible means responsive to overvoltage.

91.2 With resistor sensor:

This subclass is indented under subclass 91.1. Subject matter including a device offering resistance to a flow of electric current and wherein the overvoltage condition is detected across the device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5+, switch position dependent upon sensed current across a resistance.

31, for sensing abnormal voltage conditions in motor circuits by sensing across resistance.

57, for load shunting by sensing an abnormal voltage condition across resistance.

63+, for feeder protection with disconnect by sensing an abnormal voltage condition across resistance.

78+, for quantity comparisons including sensing overvoltage conditions across resistance.

SEE OR SEARCH CLASS:

324, Electricity: Measuring and Testing, subclass 522 for measuring resistance, per se.

338, Electrical Resistors, subclass 21 for a resistor responsive to surge voltage conditions.

91.3 Including time delay:

This subclass is indented under subclass 91.1. Subject matter wherein the overvoltage condition is detected and/or the fault is removed after a predetermined time period utilizing time delay circuitry.

SEE OR SEARCH THIS CLASS, SUBCLASS:

28+, for abnormal voltage conditions in motor circuits wherein the protective circuit responds to a fault condition after a predetermined time period.

195, for relay or solenoids safety or protection device including time delay.

SEE OR SEARCH CLASS:

327, Miscellaneous Active Electrical Nonlinear Device, Circuits, and Systems, subclass 392 for circuitry having a fixed or single time delay controlled switch.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 28, for electromagnetically actuated switches with combined timing or delay means.

337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 81 and subclass 88 for retarded or delayed action thermally actuated switch.

340, Communications: Electrical, subclass 527 for humanly perceptible means responsive to time delay.

91.4 Including photo-coupling (e.g., photo-receptors, photo-emitters, etc):

This subclass is indented under subclass 91.1. Subject matter including a means responsive to light to produce an electrical signal (i.e., photocouple) and wherein the photocoupler is utilized in the detection and/or removal of the overvoltage condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

173, for abnormal voltage conditions in relay circuits wherein a light responsive element is utilized in offering protection

SEE OR SEARCH CLASS:

324, Electricity: Measuring and Testing, subclass 420, 556 for sensing voltage conditions involving photo-coupling, per se.

91.5 Including P-N junction (e.g., a diode, a zener diode, or transistor):
This subclass is indented under subclass 91.1. Subject matter comprising a P-N junction device and wherein the device is utilized in the detection and/or fault removal of the overvoltage condition (e.g., P-N threshold breakdown or transistor clamping).

(1) Note. P-N junction circuitry protection as found predominantly within the circuitry with less emphasis on substrate configurations are classified here, however, details drawn to substrate technology should be classified in Class 257.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices, (e.g., Transistors, Solid-State Diodes), subclasses 355+ for P-N junction protection.

91.6 With zener diode sensor:
This subclass is indented under subclass 91.5. Subject matter including a zener diode sensor and wherein the overvoltage condition is detected across a zener junction.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices, (e.g., Transistors, Solid-State Diodes), subclasses 106 for tunneling P-N junction including zener diode.

91.7 Protection by snubber circuitry:
This subclass is indented under subclass 91.1. Subject matter wherein fault removal includes auxiliary circuitry which limits the rate-of-rise of voltage or current utilizing circuitry or circuit element such as RC, diode, transistor and/or inductor arrangements, individually or in combination therewith.

SEE OR SEARCH THIS CLASS, SUBCLASS:
13, for switch protection including alternative current shunting paths.
15+, for capacitor protection via current shunting paths.
18, for voltage regulation wherein upon interruption, excess currents dissipated.
58, for load shunting by sensing an abnormal voltage condition where excess energy is dissipated.

91.8 Protection for thyristor:
This subclass is indented under subclass 91.1. Subject matter including a thyristor and wherein the overvoltage protection is applied to the thyristor or circuitry including the thyristor.

SEE OR SEARCH THIS CLASS, SUBCLASS:
15+, for capacitor protection including thyristor switching networks having overvoltage protection.
18, for voltage regulation incorporating voltage conversion utilizing controlling thyristors having overvoltage protection.
23+, for motor control circuitry including thyristors.
58, for shunt circuitry including thyristors.

SEE OR SEARCH CLASS:
323, Electricity: Power Supply or Regulation Systems, subclasses 50+ for thyristor protection.

92 Undervoltage:
This subclass is indented under subclass 88. Subject matter under subclass wherein in fault sensor is responsive to an undervoltage condition.

93.1 With specific current responsive fault sensor:
This subclass is indented under subclass 1. Subject matter wherein the fault sensor responds to an abnormal current condition in an electrical system and to activate the protective means in response thereto.

(1) Note. This subclass relates to protection involving abnormal current conditions which are considered to be fault conditions and not otherwise.

(2) Note. Fault conditions are defined as those which could result in damage to the electrical system, if ignored. Abnormal current conditions include both

overcurrents and undercurrents, unless indicated otherwise.

SEE OR SEARCH THIS CLASS, SUBCLASS:

5, for current responsive control circuits in arc suppression circuits.

31, for current responsive control circuitry in motor protective circuits.

57, for current responsive control circuitry in load shunting circuits.

63+, for current responsive control circuitry in feeder distribution networks.

87, for current responsive control circuitry in quantity comparison circuits.

SEE OR SEARCH CLASS:

323, Electricity: Power Supply or Regulation Systems, subclass 277 for output level responsive to load current sensor.

324, Electricity: Measuring and Testing, subclass 509 for ground fault sensing by detecting current leakage to ground, and subclass 522 for fault location determination by current or voltage measuring.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 18, for electromagnetically actuated switches responsive to predetermined or abnormal current condition.

93.2 Digital control:

This subclass is indented under subclass 93.1. Subject matter wherein the protective device includes processing circuitry (i.e., micro-controller, micro-processor, memory device) and the processing circuitry is utilized in the fault removal of the sensed abnormal current condition.

(1) Note. Subject matter of this subclass is not drawn to substantial specifics of data processing or formula computing operations by the processing circuitry.

SEE OR SEARCH CLASS:

700, Data Processing: Generic Control Systems or Specific Applications, subclasses 79 through 82 for computer system relating to protection and reliability of control system.

702, Data Processing: Measuring, Calibrating, or Testing, subclasses 60 through 63 for power parameter measurement and subclasses 64 and 65 for voltage or current parameter measuring in an electrical system or method.

93.3 Rating plug:

This subclass is indented under subclass 93.1. Subject matter wherein the protective device includes a removable component and wherein the component allows setting of current ratings and/or trip specifications for the fault removal.

(1) Note. Removable components range from jumper wires and burden resistors to printed circuit boards.

SEE OR SEARCH THIS CLASS, SUBCLASS:

633, for a plugboard in housing or mounting assemblies with diverse electrical components.

93.4 Automatic reset after trip:

This subclass is indented under subclass 93.1. Subject matter wherein the protective device interrupts the electrical system in response to the sensed abnormal current condition, and thereafter automatically restores the system to its normal operating conditions.

SEE OR SEARCH THIS CLASS, SUBCLASS:

59+, for a circuit automatically connected only after fault is cleared.

71+, for automatic reclosing.

SEE OR SEARCH CLASS:

335, Electricity: Magnetically Operated Switches, Magnets and Electromagnets, subclasses 26+ and 166 for a magnetically operated switch or electromagnet having a latch or trip circuitry including reclosing or resetting features.

337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 130 and subclass 155 for a thermally actuated switch having a latching mechanism including reset or reclosing features.

93.5 Transformer and resistor sensors:
This subclass is indented under subclass 93.1. Subject matter including an inductively coupled device and a resistive device and wherein the abnormal current condition is detected with both the inductively coupled device and the resistive device.

93.6 Transformer sensor (i.e., toroidal current sensor):
Subject matter under 93.1 including an inductively coupled device and wherein the abnormal current condition is detected with the inductively coupled device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
42+, for ground-fault current condition sensing utilizing toroids or current transformers.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclass 244 for sensing utilizing saturable core magnetometers and subclass 529 for sensing fault location with magnetic field sensors.
336, Inductor Devices, subclass 175 for details drawn to transformer sensor.
340, Communications: Electrical, subclass 646 for a transformer utilized in humanly perceptible means in responsive to a predetermined condition.
374, Thermal Measuring and Testing, subclass 152 for temperature measuring including electrical component (e.g., transformer).

93.7 Resistor sensor:
This subclass is indented under subclass 93.1. Subject matter including a device offering resistance to a flow of electric current and wherein the abnormal current condition is detected with the resistive device.

SEE OR SEARCH CLASS:
338, Electrical Resistors, subclasses 2+ for details drawn to a resistor sensor, per se, and subclass 20 for a resistor responsive to current or voltage impressed across the resistor.

93.8 Thermal sensing:
This subclass is indented under subclass 93.1. Subject matter including a means responsive to a predetermined amount of heat and wherein the abnormal current condition is determined by the heat responsive means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
103, for electrical system interruption by thermal sensing.

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets and Electromagnets, subclass 44 for magnetically operated switches including ambient temperature compensating means.
336, Inductor Devices, subclass 179 for coil with temperature compensating means.
374, Thermal Measuring and Testing, appropriate subclass for measuring and testing thermal quantities.

93.9 Current limiting:
This subclass is indented under subclass 93.1. Subject matter wherein the protective device includes a means for reducing the flow of the sensed overcurrent without interrupting the flow of current in the electrical system.

SEE OR SEARCH THIS CLASS, SUBCLASS:
58, for load shunting by sensing an abnormal voltage condition.

SEE OR SEARCH CLASS:
323, Electricity: Power Supply or Regulation Systems, subclass 276 for limiting current to a load within a regulator system.

94 With time delay protective means:
This subclass is indented under subclass 93.1. Subject matter wherein the protective means is activated at a predetermined time after the fault is sensed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
195+, for time delay circuits in relay and solenoid systems.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 141 for time delay circuits in switching systems.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 261+ and 392+ for miscellaneous delay circuits.

95 With instantaneous override:

This subclass is indented under subclass 94. Subject matter wherein the protective means is activated at a predetermined time after a first level fault is sensed, or immediately after a fault of a higher predetermined level is sensed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

111, for general transient responsive circuits (disconnects circuit).

96 With multiple timing characteristics (e.g., short, long):

This subclass is indented under subclass 95. Subject matter wherein the protective means is activated after a short, intermediate, long, etc., time delay depending on the magnitude of the fault sensed.

97 With multiple timing characteristics:

This subclass is indented under subclass 94. Subject matter wherein the protective means is activated after a short, long, intermediate, etc., time delay depending on the magnitude of the fault sensed.

98 Transistorized:

This subclass is indented under subclass 94. Subject matter wherein the protective system utilizes solid state components.

99 Combined thermal-electromagnetic relay:

This subclass is indented under subclass 94. Subject matter wherein thermal and electromagnetic means are combined to perform the timing or circuit interrupt functions.

SEE OR SEARCH CLASS:

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 35+ for electromagnetically operated circuit breakers with combined magnetic and thermal trip means, and subclasses 141+ for switches with combined magnetic and thermal operating means.

337, Electricity: Electrothermally or Thermally Actuated Switches, appropriate subclasses for thermal-type circuit breakers, per se.

100 With semiconductor circuit interrupter (e.g., SCR, triac, tunnel diode, etc.):

This subclass is indented under subclass 93.1. Subject matter wherein the protective device which causes the current to the load to be discontinued is of the semiconductor type.

SEE OR SEARCH CLASS:

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 365+ for semiconductor interrupter, per se.

101 With transistor circuit interrupter:

This subclass is indented under subclass 100. Subject matter wherein the protective device which causes the current to the load to be discontinued is of the transistor type.

102 With mechanical circuit breaker:

This subclass is indented under subclass 93.1. Subject matter wherein the protective device which disconnects the load from the source is of the mechanical circuit breaker type.

SEE OR SEARCH THIS CLASS, SUBCLASS:

115+, for subject matter with specific circuit breaker or circuit breaker control structure.

SEE OR SEARCH CLASS:

200, Electricity: Circuit Makers and Breakers, for specific mechanical circuit breaker.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 2+ for specific electromagnetic circuit breaker.

103 Circuit interruption by thermal sensing:

This subclass is indented under subclass 1. Subject matter wherein a thermally responsive device detects either the excessive heat of the device being protected or the excessive heat

generated in the thermally responsive device and activates the circuit interrupter which disconnects the load from the source.

SEE OR SEARCH THIS CLASS, SUBCLASS:
124+, for thermally responsive high voltage dissipation devices.

SEE OR SEARCH CLASS:
337, Electricity: Electrothermally or Thermally Actuated Switches, for similar subject matter.
340, Communications: Electrical, subclasses 584+ for electrical thermal alarms and signals.

104 With fuse:
This subclass is indented under subclass 103. Subject matter wherein the thermally responsive device is a fuse.

105 With bimetallic element:
This subclass is indented under subclass 103. Subject matter wherein the thermally responsive device is a bimetallic element.

106 With thermistor:
This subclass is indented under subclass 103. Subject matter wherein the thermally responsive device is a resistor whose characteristics vary with temperature.

SEE OR SEARCH CLASS:
338, Electrical Resistors, subclasses 25+ for the thermally responsive resistor, per se.

107 With specific transmission line (e.g., guarded):
This subclass is indented under subclass 1. Subject matter wherein the transmission line has significant mechanical or structural features.

(1) Note. The transmission line, for example, may be provided with guarding means, such as ground wires which act as shields.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, for conductors, per se.

108 Plural conductors in single sheath (e.g., compound):
This subclass is indented under subclass 107. Subject matter having plural conductors in a single sheath.

(1) Note. This subclass relates, for example, to systems using “compound” cables.

109 Too large fault makes breaker inoperative:
This subclass is indented under subclass 1. Subject matter having means for rendering a circuit breaker inoperative in the presence of a fault of such a large size that the circuit breaker cannot handle it.

(1) Note. This subclass relates, for example, to circuit breaker systems in which a smaller capacity circuit breaker has associated with it “back up” protection and in which only the “back up” protection operates on very large faults.

110 Transient nonresponsive (e.g., ignores surge on transmission line):
This subclass is indented under subclass 1. Subject matter wherein the protective means does not respond to a large transient surge.

(1) Note. During a switching operation a surge is normally induced. The subject matter in this subclass is nonresponsive to that surge.

111 Transient responsive:
This subclass is indented under subclass 1. Subject matter wherein the protective means responds to a transient surge, normally caused by switching.

SEE OR SEARCH THIS CLASS, SUBCLASS:
95, for instantaneous override in current responsive systems.

112 With space discharge means:
This subclass is indented under subclass 1. Subject matter having space discharge means.

SEE OR SEARCH CLASS:
313, Electric Lamp and Discharge Devices, appropriate subclasses for space discharge means, per se.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous space discharge systems not otherwise classified.

113 With tuned circuit:
This subclass is indented under subclass 1. Subject matter having a tuned circuit.

114 With manual or automatic opening of breaker and manual reclose:
This subclass is indented under subclass 1. Subject matter which is provided with means to open the circuit breaker either manually or automatically and to reclose the breaker manually.

(1) Note. This subclass relates, for example, to systems having both a local manual control and a remote automatic control for a circuit breaker.

115 With specific circuit breaker or control structure:
This subclass is indented under subclass 1. Subject matter wherein the circuit breaker or its control means has significant mechanical features.

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, appropriate subclasses for the structure of electromagnetically operated circuit breakers, per se.

116 Pneumatically operated circuit breaker:
This subclass is indented under subclass 115. Subject matter wherein the circuit breaker is operated by pneumatic means.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclasses 81+ for fluid pressure operated circuit breakers, per se.

117 High voltage dissipation (e.g., lightning arrester):
This subclass is indented under subclass 1. Subject matter comprising means for reducing the voltage of a surge applied to its terminals without disconnecting the load.

(1) Note. The surge normally being applied by lightning.

(2) Note. This subclass relates, for example, to lightning arresters and surge dissipators, where the line wire or some other structure that relates to the conductor is claimed. When the line wire is not claimed, and only the terminals of the dissipator are claimed the dissipator is classified in one of the classes referred to under search class below.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 2+ for lightning protection by means of conductive structure, such as lightning rods; also, consult the search notes to this subclass. Search subclasses 140+ for insulators combined with conductive arcing or stress distributing means.
313, Electric Lamp and Discharge Devices, appropriate subclasses for lightning arresters of the arc or spark gap type, not having line conductor structure. Also consult the search notes in the class definition for related art.
337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 28 for lightning arresters combined with thermal current type circuit breakers.
338, Electrical Resistors, subclasses 20+ for electric resistors responsive to current and/or voltage changes.

118 Surge prevention (e.g., choke coil):
This subclass is indented under subclass 117. Subject matter consisting of means to diminish the effect of transient surges of short duration.

SEE OR SEARCH THIS CLASS, SUBCLASS:
40, for surge prevention in transformer circuits.
111, for general transient responsive circuits (disconnects circuit).

119 In communication systems:
This subclass is indented under subclass 118. Subject matter specifically for the protection of communication systems (e.g., radio, T.V., etc.).

120 Vacuum or gas filled space discharge:
This subclass is indented under subclass 117. Subject matter having a vacuum chamber or a gas filled or vapor filled chamber through which electricity passes by means of space conduction.

121 Fluid (e.g., mercury, quenching):
This subclass is indented under subclass 117. Subject matter having a fluid filled chamber through which electricity passes.

122 Electrolytic:
This subclass is indented under subclass 121. Subject matter wherein the fluid utilized is an electrolyte.

123 Gas blast:
This subclass is indented under subclass 121. Subject matter wherein the fluid may be vaporized by an arc therethrough and as a result, creates a blast of vapor which will blowout the arc, or the fluid may be compressed air which, upon being released, will blowout the arc.

124 Thermal (e.g., fusible, bimetallic):
This subclass is indented under subclass 117. Subject matter wherein the protective device responds to an abnormal temperature created by a surge.

(1) Note. This subclass relates, for example, to high voltage dissipators having fusible links, or having bimetallic elements which move when their temperature changes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
103, for protection circuits which utilize thermal sensors.

SEE OR SEARCH CLASS:
337, Electricity: Electrothermally or Thermally Actuated Switches, subclasses 298+ for specific thermal switch.

125 With cutout (e.g., blowout type):
This subclass is indented under subclass 124. Subject matter including a switch containing a material which disintegrates or separates to protect the lightning arrester.

126 Current limiting material in discharge path:
This subclass is indented under subclass 117. Subject matter including a current limiting material in the discharge path.

(1) Note. This subclass relates, for example, to high voltage dissipators in which an arc takes place through a porous composition when a high voltage must be dissipated to ground.

127 Nonlinear material (e.g., valve type):
This subclass is indented under subclass 126. Subject matter in which the current limiting material is a conductive nonlinear material.

(1) Note. The material utilized is usually of a negative coefficient type, which allow the initial surge to easily pass to ground and effectively blocks the follow current.

128 With plural gaps in discharge path:
This subclass is indented under subclass 127. Subject matter including plural gaps in the discharge path which increase the current handling capabilities of the lightning arrester.

129 Plural gaps with common electrode:
This subclass is indented under subclass 117. Subject matter including plural gaps in the discharge path with a common electrode.

SEE OR SEARCH CLASS:
313, Electric Lamp and Discharge Devices, subclasses 243+ for plural air gap discharge devices not having line or conductor structure as part thereof.

130 Plural gaps serially connected:
This subclass is indented under subclass 117. Subject matter including plural gaps in the discharge path which are serially connected to increase the current handling capabilities of the lightning arrester.

SEE OR SEARCH CLASS:
315, Electric Lamp and Discharge Devices: Systems, subclass 36 for subcombination of lightning arrester.

131 Combined (e.g., with disconnect switch):
This subclass is indented under subclass 117. Subject matter combined with some other type of subject matter (e.g., disconnect switch).

SEE OR SEARCH THIS CLASS, SUBCLASS:
40, for high voltage dissipator combined with transformer.

132 With line supporting insulator:
This subclass is indented under subclass 131. Subject matter in combination with a line supporting insulator.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, for line supporting insulators, per se.

133 With magnetic means (e.g., electromagnet):
This subclass is indented under subclass 117. Subject matter including magnetic means associated with the discharge circuit.

134 Arc stretching (e.g., blowout):
This subclass is indented under subclass 133. Subject matter wherein magnetic means are used to lengthen the arc thereby isolating the load circuit.

SEE OR SEARCH CLASS:
218, High-Voltage Switches With Arc Preventing and Extinguishing Devices, subclasses 22+ for magnetic blowouts used with switches.
313, Electric Lamp and Discharge Devices, subclasses 153+ for miscellaneous space discharge devices having magnetic means for influencing the space discharge.

135 By separating contacts:
This subclass is indented under subclass 134. Subject matter wherein magnetic means are used for separating the contacts across which the arc is stretched.

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, appropriate subclasses for electromagnetically operated switches in which an electromagnet is used as a source of force to separate two or more contacts.

136 For grounding line:
This subclass is indented under subclass 133. Subject matter wherein the magnetic means is used to ground the lines.

137 Horn gap:
This subclass is indented under subclass 117. Subject matter consisting of a horn gap.

(1) Note. A horn gap is defined as being an air gap between two electrodes which have such a configuration that the arc, which takes place between them when the gap breaks down, is located first at a point where the electrodes are closely adjacent to each other, and then, under the action of the resulting electrical or thermal currents, rises and lengthens by shifting to a region where the distance between the electrodes is greater. Eventually, the arc ruptures because of its great length.

138 With resistance insertion:
This subclass is indented under subclass 137. Subject matter wherein resistances are inserted in the path of the arc as it lengthens.

SEE OR SEARCH THIS CLASS, SUBCLASS:
12, for inserting impedance in horn gap in arc suppression systems.

139 CONTROL CIRCUITS FOR ELECTROMAGNETIC DEVICES:
This subclass is indented under the class definition. Subject matter relating to control circuits for relays and other electromagnetic devices.

(1) Note. When the relay controls a particular device, classification is not in this subclass but is in the class that provides for the art environment. Note that many electrical and nonelectrical classes have disclosures which include, as part thereof, relay and electromagnet control circuits. Therefore, in appropriate instances, the search should extend to the class which relates to the environment in

which the relay or electromagnet circuit might be found.

SEE OR SEARCH CLASS:

178, Telegraphy, appropriate subclasses for television and telegraph systems utilizing electromagnets and relays. Note, particularly subclasses 70+ for telegraph code repeaters.

222, Dispensing, for dispensing devices utilizing electromagnetic actuators.

235, Registers, subclasses 61+ for electric calculators having relay type counting chains.

251, Valves and Valve Actuation, subclasses 129.01+ for electromagnetic valve operators.

307, Electrical Transmission or Interconnection Systems, subclass 101 for miscellaneous remnant and residual magnetism control, subclass 104 for miscellaneous electromagnet and highly inductive systems, and subclasses 112+ for miscellaneous switching systems.

313, Electric Lamp and Discharge Devices, subclasses 153+ and 364+ for cathode-ray, lamp and space discharge devices having magnetic means.

314, Electric Lamp and Discharge Devices: Consumable Electrode, for arc lamps having electromagnet or relay means to control the arc. Note-for example, subclasses 78, 113+ and 135.

315, Electric Lamp and Discharge Devices: Systems, subclasses 399+ for cathode-ray tube deflecting circuits utilizing electromagnets.

318, Electricity: Motive Power Systems, appropriate subclasses for electric motor control systems utilizing electromagnets or relays. Note that any electromagnet is an electrothermal transducer and therefore it is an electric motor. Also, see subclass 492 means to dissipate the magnetic energy of the electric motor.

322, Electricity: Single Generator Systems, appropriate subclasses, especially subclasses 17+ for generator systems having relay control means.

323, Electricity: Power Supply or Regulation Systems, appropriate subclasses for voltage control and phase control systems having relays and electromagnets.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous nonlinear active device circuits.

331, Oscillators, appropriate subclasses for self-sustained electric wave generator systems of the nondynamoelectric type.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, appropriate subclasses for electromagnetic relays, per se.

379, Telephonic Communications, appropriate subclasses for telephone systems utilizing electromagnets and relays.

600, Surgery, subclasses 9+.

607, Surgery: Light, Thermal, and Electrical Application, subclass 1.

140 Including compensation for thermal change of electromagnetic device:

This subclass is indented under subclass 139. Subject matter wherein circuits or devices are included which compensate for any thermal changes of the electromagnetic device caused by ambient temperature changes or by the heat generated during the operation of the device.

SEE OR SEARCH CLASS:

324, Electricity: Measuring and Testing, subclass 105 for electric meters having thermal compensating means.

338, Electrical Resistors, subclasses 7+ for electrical resistors whose resistance value is temperature compensated.

141 Including superconductivity:

This subclass is indented under subclass 139. Subject matter utilizing electromagnetic devices or control circuit conductors which are superconductive.

(1) Note. Superconductivity is a property possessed by some metals, alloys, and compounds when their temperature is reduced to within a few degrees of absolute zero. There is a steady fall of resistance with temperature in these materials

until a critical temperature (transition temperature) is reached, and then the resistance falls suddenly to zero or practically to zero.

SEE OR SEARCH CLASS:
505, Superconductor Technology: Apparatus, Material, Process, particularly subclasses 150+ for high temperature (T_c 30 K) superconducting systems or devices, subclass 192 for capacitors having high temperature superconducting materials, and cross-reference art collections in subclass 851 for control circuits for electromagnetic devices that are superconductive, or that control superconductive devices.

142 Including housing:
This subclass is indented under subclass 139. Subject matter wherein the control circuit or the electromagnetic device or both are housed or enclosed.

(1) Note. The enclosure is specifically designed to protect the control circuit or device against damage or heat, or to be a plug-in unit.

143 Systems for magnetizing, demagnetizing or controlling the magnetic field:
This subclass is indented under subclass 139. Subject matter including systems and processes for magnetizing, demagnetizing or effecting a magnetic field by means of controlled energization or deenergization of an electromagnetic coil.

(1) Note. This subclass includes, for example, processes for demagnetizing the hair springs of a watch and systems for supplying energy to a demagnetizing coil.

(2) Note. Where the demagnetizing is combined with the specific features of the art environment, the search should extend to the class which relates to the art environment.

144 For lifting or holding:
This subclass is indented under subclass 143. Subject matter wherein the electromagnet is used for lifting, suspending, holding or displacing objects by controlling the field of the electromagnet.

SEE OR SEARCH CLASS:
310, Electrical Generator or Motor Structure, subclass 90.5 for magnetic supports.

145 Magnetic chuck-type:
This subclass is indented under subclass 144. Subject matter wherein the work function is performed by a magnetic chuck-type electromagnet.

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 291 for magnetic chuck structure.

146 Systems for magnetic field stabilization or compensation:
This subclass is indented under subclass 143. Subject matter including systems which maintain the value of the force of the magnetic field or compensate for the effects of external magnetic forces on the electromagnet.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclasses 300+ for related subject matter involving nuclear induction.

147 With permanent magnet:
This subclass is indented under subclass 143. Subject matter wherein a permanent magnet is combined with the electromagnet.

148 Calibration or permanent magnet:
This subclass is indented under subclass 147. Subject matter wherein the strength of the field of the permanent magnet is adjusted to a predetermined value.

149 Demagnetizing:
This subclass is indented under subclass 143. Subject matter including systems and processes for neutralizing a magnetic field by means of controlled energization or deenergization of an electromagnetic coil.

SEE OR SEARCH THIS CLASS, SUBCLASS:
267, for demagnetizing systems and processes, per se.

150 Television degaussing:
This subclass is indented under subclass 149. Subject matter wherein the demagnetizing system or process is peculiar to a television receiver.

SEE OR SEARCH CLASS:
315, Electric Lamp and Discharge Devices: Systems, subclass 8 for cathode-ray tube degaussing systems.

151 Magnetic tape:
This subclass is indented under subclass 149. Subject matter wherein the demagnetizing system or process is peculiar to neutralizing magnetic tape.

152 Including particular drive circuit:
This subclass is indented under subclass 143. Subject matter including a drive circuit specifically designed to meet the required operating parameters of an electromagnetic device.

(1) Note. The drive circuits included satisfy such operating parameters as providing plural distinct operating currents or providing pulses to the device to operate it in a specific manner.

153 Pulse initiated:
This subclass is indented under subclass 152. Subject matter wherein a circuit or device which responds to a voltage pulse signal is used to initiate the operation of the electromagnetic device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
186, for miscellaneous pulse initiated control circuits for relays and solenoids.

154 Including means to establish plural distinct current levels (e.g., high, low):
This subclass is indented under subclass 152. Subject matter wherein the drive circuit includes means to establish plural distinct current levels.

(1) Note. The plural distinct current levels may include, for example, a high initial current to quickly operate the relay and subsequent lesser current value to "hold" the relay operated.

155 With capacitor charging or discharging through coil:
This subclass is indented under subclass 154. Subject matter wherein the plural current levels are obtained by the charging or discharging of a capacitor through the coil of the electromagnetic device.

156 With capacitor charging or discharging through coil:
This subclass is indented under subclass 152. Subject matter wherein the drive circuit includes the charging or discharging of a capacitor through the coil of the device to control the operating current.

SEE OR SEARCH THIS CLASS, SUBCLASS:
155, for plural distinct current levels.

157 Including instrument (e.g., meter-relay):
This subclass is indented under subclass 139. Subject matter wherein an instrument is included in the control circuit.

(1) Note. The instrument may itself be the combination of a meter with contacts or a relay may be combined with the meter so that the meter movement actuates the relay.

158 Temperature indicating instrument:
This subclass is indented under subclass 157. Subject matter wherein the instrument of the meter-relay combination gives an indication of temperature.

159 Including means for using, or compensating for the induced EMF of the electromagnetic device:
This subclass is indented under subclass 139. Subject matter wherein a circuit or device is included which utilizes the induced electromotive force generated by the operation of the electromagnetic device.

(1) Note. The system may, for example, store the induced EMF and subsequently use this stored EMF to aid in operating the electromagnetic device.

160 For relays or solenoids:
This subclass is indented under subclass 139. Subject matter wherein the electromagnetic device is a relay or a solenoid.

161 Including thermal device:
This subclass is indented under subclass 160. Subject matter wherein a thermal device is included in the control circuit of the relay or solenoid.

SEE OR SEARCH CLASS:
338, Electrical Resistors, subclasses 25+ for electrical resistors responsive to a change in ambient temperature.

162 Thermoelectric:
This subclass is indented under subclass 161. Subject matter wherein the thermal device is of the thermo couple type.

163 Bimetallic element:
This subclass is indented under subclass 161. Subject matter wherein the thermal device is a bimetallic element.

164 Including heater:
This subclass is indented under subclass 163. Subject matter which includes a heating element to control the operation of the bimetallic element.

165 Thermistor:
This subclass is indented under subclass 161. Subject matter wherein the thermal device is a thermistor.

166 Plural relays or solenoids sequentially operated:
This subclass is indented under subclass 160. Subject matter having plural relays or solenoids as the controlled devices which are operated in a predetermined sequence.

SEE OR SEARCH THIS CLASS, SUBCLASS:
171, for this subject matter with code responsive control circuit.

167 Alternately operated:
This subclass is indented under subclass 166. Subject matter wherein the plural relays or solenoids are operated in an alternate sequence.

168.1 Pulse responsive:
This subclass is indented under subclass 166. Subject matter wherein the predetermined sequence of operation of the relays or solenoids are controlled by a drive circuit or device which responds to a voltage pulse circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
186, for pulse responsive control circuits.

SEE OR SEARCH CLASS:
329, Demodulators, subclasses 311+ for pulse demodulators.
340, Communications: Electrical, subclass 825.66 for selective circuits using relay counting chains.
377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, subclass 65 for shift registers using electromechanical relays and subclass 83 for counting chains using relays.

169.1 Including electronic element:
This subclass is indented under subclass 168.1. Subject matter wherein electronic devices are utilized.

SEE OR SEARCH THIS CLASS, SUBCLASS:
172, for this subject matter in pulse responsive control circuits.

170 Condition responsive (e.g., external circuit condition):
This subclass is indented under subclass 160. Subject matter including circuits or devices which respond to external circuit conditions to initiate the operation of the relay or solenoid.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclasses 116+ for condition responsive circuits in switching systems.

327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 509+ for miscellaneous external effect circuits.

340, Communications: Electrical, subclasses 500+ for condition responsive circuits in communication systems.

171 Code responsive:
This subclass is indented under subclass 170. Subject matter wherein the external circuit condition required to operate the relay or solenoid is the application of the proper code pulses to the control circuit.

SEE OR SEARCH CLASS:

70, Locks, subclass 278.1 for this subject matter utilized in locks.

340, Communications: Electrical, subclasses 825+ for this subject matter in miscellaneous selective systems such as remote control systems.

172 Including electronic element:
This subclass is indented under subclass 171. Subject matter wherein electronic devices are utilized.

173 Light:
This subclass is indented under subclass 170. Subject matter wherein a light responsive element is used to initiate the operation of the relay or solenoid.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclasses 200+ for photoelectric cell circuits not having a relay or solenoid as the last element controlled.

307, Electrical Transmission or Interconnection Systems, subclass 117 for miscellaneous light responsive switching systems.

315, Electric Lamp and Discharge Devices: Systems, subclasses 149+ for electric lamp and discharge devices with radiant energy sensitive control means.

330, Amplifiers, subclass 59 for amplifier systems including light controlled or activated devices.

331, Oscillators, subclass 66 for light responsive devices combined with oscillators.

174 Light sensor controls its light path:
This subclass is indented under subclass 173. Subject matter wherein the light sensor controls its own optical system, by which it is illuminated.

175 Including electronic element:
This subclass is indented under subclass 173. Subject matter wherein electronic devices are utilized.

176 Plural light sensors:
This subclass is indented under subclass 175. Subject matter wherein more than one light sensor is included in the control circuit.

177 Plural light sensors:
This subclass is indented under subclass 173. Subject matter wherein more than one light sensor is included in the control circuit.

178 Fluid (e.g., liquid level, humidity):
This subclass is indented under subclass 170. Subject matter wherein the initiating device or circuit is responsive to the condition of a fluid (liquid or gas).

(1) Note. The system may, for example, respond to precipitation, fluid level or flow, humidity of fluid pressure.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclass 602 for moisture or humidity; subclass 604 for wetness; and subclasses 618+ for liquid level alarm systems, respectively.

179 Proximity or contact:
This subclass is indented under subclass 170. Subject matter wherein the device or circuit which initiates the operation of the relay or solenoid is responsive to an object coming very close to or touching the device.

180 Metal presence or absence responsive:
This subclass is indented under subclass 179. Subject matter wherein the initiating device or circuit responds to the presence or absence of metal in proximity to or contact with the device.

181 Capacitance change-type:
This subclass is indented under subclass 179. Subject matter wherein the initiating device or circuit responds to a change in capacitance at the detecting electrode.

182 Frequency (e.g., audio, radio):
This subclass is indented under subclass 170. Subject matter wherein circuits or devices which respond to audio or radio frequencies are used to initiate the operation of the relay or solenoid.

SEE OR SEARCH CLASS:
178, Telegraphy, subclasses 47+ for this subject matter in telegraph systems.
340, Communications: Electrical, subclasses 825+ for this subject matter in miscellaneous communication systems.

183 Plural relays or solenoids as loads:
This subclass is indented under subclass 182. Subject matter wherein two or more relays or solenoids are controlled by one or more frequency signals.

SEE OR SEARCH THIS CLASS, SUBCLASS:
191+, for plural relay solenoid loads selectively operated.

184 Specific Frequency Responsive Relay:
This subclass is indented under subclass 182. Subject matter which includes a relay which only operates when excited with a supply of a predetermined frequency.

185 Phase:
This subclass is indented under subclass 170. Subject matter wherein a circuit or device which responds to a particular phase of a current or voltage signal is used to initiate the operation of the relay.

186 Pulse:
This subclass is indented under subclass 170. Subject matter wherein a circuit or device which responds to a pulse signal is used to initiate the operation of the relay.

SEE OR SEARCH THIS CLASS, SUBCLASS:
153, for pulse responsive circuits in drive circuits which are peculiar to electromagnetic devices.

SEE OR SEARCH CLASS:
329, Demodulators, subclasses 311+ for pulse demodulators.
340, Communications: Electrical, subclasses 825.57+ for this subject matter, especially in miscellaneous communication systems.

187 Voltage or current level discriminators:
This subclass is indented under subclass 170. Subject matter wherein the initiating device or circuit responds only to a specific voltage or current level applied to it.

188 Variable impedance:
This subclass is indented under subclass 170. Subject matter wherein the initiating circuit or device is responsive to variable impedance values.

189 Plural switches in control circuit:
This subclass is indented under subclass 160. Subject matter wherein more than one switch is included in the control circuit, all of which must be operated to initiate the operation of the relay.

190 Including electronic switch:
This subclass is indented under subclass 189. Subject matter wherein at least one of the switches in the control circuit is of the electronic type.

191 Plural relay or solenoid loads selectively operated:
This subclass is indented under subclass 160. Subject matter including plural relay load circuits which are selectively operated.

(1) Note. This subclass relates, for example, to selective systems for selecting any one of plural relays.

SEE OR SEARCH THIS CLASS, SUBCLASS:
171, for this subject matter in code responsive control circuits.

183, for subject matter wherein two or more relays or solenoids are controlled by plural frequency signals.

192 Including interlock:
This subclass is indented under subclass 191. Subject matter wherein the relays or solenoids are interconnected either electrically or mechanically so that only the selected one or ones can be maintained in an actuated condition at any given moment.

193 Electronic interlock:
This subclass is indented under subclass 192. Subject matter wherein the interlocking of the relays or solenoids is controlled by electronic circuits or devices.

194 Holding means:
This subclass is indented under subclass 160. Subject matter having holding means to hold the relay or solenoid in the operated state, despite the lapsing of the original control signal.

195 Time delay:
This subclass is indented under subclass 160. Subject matter wherein circuits or devices are included which initiate the operation of the relay a predetermined interval of time after the initiation of a control function.

SEE OR SEARCH CLASS:
327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 261+ and 392+ for miscellaneous timing and delay circuits, per se.
340, Communications: Electrical, subclasses 527+ for a condition responsive signalling system having a time delay circuit.

196 Including semiconductor device connected to timing element:
This subclass is indented under subclass 195. Subject matter wherein the control circuit includes a semiconductor device connected between the timing circuit and the relay.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se.
327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous semiconductor circuits and devices.

197 Threshold device (e.g., zener, schockley diode):
This subclass is indented under subclass 196. Subject matter wherein a semiconductor device conducts current when the potential applied across it reaches a specific value.

SEE OR SEARCH THIS CLASS, SUBCLASS:
200, and 205, for threshold devices in other control circuits.

198 Including three or more electrodes (e.g., unijunction):
This subclass is indented under subclass 197. Subject matter wherein the semiconductor device has three or more electrodes.

199 Including electric discharge device:
This subclass is indented under subclass 195. Subject matter wherein the control circuit includes an electric discharge device connected between the timing circuit and the relay.

SEE OR SEARCH CLASS:
327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous space discharge tube circuits. Also, consult the main class search notes and the search notes to the subclasses for a compilation of other classes having related art.

200 Threshold device (neon tube):
This subclass is indented under subclass 199. Subject matter wherein the electric discharge device conducts current when the potential applied across it reaches a specific value.

SEE OR SEARCH THIS CLASS, SUBCLASS:
197, and 205, for threshold devices in other control circuits.

201 Including thyratron:
This subclass is indented under subclass 200. Subject matter wherein the threshold device is a thyratron.

SEE OR SEARCH THIS CLASS, SUBCLASS:
256, and 354, for other control circuits utilizing a thyratron as a threshold device.

202 Electromechanical delay means:
This subclass is indented under subclass 195. Subject matter wherein the predetermined interval of time required is controlled by an electromechanical device.

(1) Note. Electromechanical device may be an electric motor or solenoid with a cam operated switch, or a mechanical device connected to the relay or solenoid to delay operation (e.g., a dashpot, escapement mechanism, etc.).

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 59+ for electro-magnetically operated switches with time delay, and subclasses 239+ for electromagnetic relays with time delay.

203 With oscillator:
This subclass is indented under subclass 160. Subject matter which includes an oscillator in the control circuit.

SEE OR SEARCH CLASS:
331, Oscillators, appropriate subclass for electric oscillation generators, per se.

204 With magnetic amplifier or saturable reactor:
This subclass is indented under subclass 160. Subject matter having a magnetic amplifier or saturable reactor in the control circuit.

SEE OR SEARCH CLASS:
307, Electrical Transmission or Interconnection Systems, subclasses 401+ for nonlinear reactor systems.

205 Threshold device (e.g., SCR, thyratron):
This subclass is indented under subclass 160. Subject matter wherein a threshold device, which conducts current when the potential applied across it reaches a specific value, is connected to the coil of the electromagnetic device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
197+, and 200+, for threshold devices in time delay control circuits.

206 Particular relay or solenoid:
This subclass is indented under subclass 160. Subject matter wherein the electromagnetic device is distinctive structurally or in its operation.

207 Electrostatic:
This subclass is indented under subclass 206. Subject matter having electrostatic means.

(1) Note. The electrostatic means may, for example, be a piezoelectric crystal which is an integral part of a relay and which is utilized to operate the relay contacts or the electrostatic means may be in the circuit which actuates the relay or electromagnet as, for example, an electrostatic dry clutch which is utilized in a control apparatus in the input circuit to the relay electromagnet.

208 Polarized:
This subclass is indented under subclass 206. Subject matter wherein the movement of the armature depends upon the direction of the current in the control circuit.

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 230+ for polarized electromagnets with armatures, per se.

209 Alternating current type:
This subclass is indented under subclass 206. Subject matter wherein the device is responsive to alternating current energization.

210 Plural coils:
This subclass is indented under subclass 206. Subject matter wherein more than one coil is required in its operation.

211 CONTROL CIRCUITS FOR NONELECTROMAGNETIC TYPE RELAY (E.G., THERMAL RELAYS):
This subclass is indented under the class definition. Subject matter relating to control circuits for relays which utilize means other than electromechanical means to open or close electrical contacts.

(1) Note. For example, a bimetallic device may be used as the relay contact making means.

212 DISCHARGING OR PREVENTING ACCUMULATION OF ELECTRIC CHARGE (E.G., STATIC ELECTRICITY):
This subclass is indented under the class definition. Subject matter relating to the dissipation of any residual electric charge present on or in an object or material.

(1) Note. Where the discharge of the static electricity is combined with the specific features of the art environment, the search should extend to the class which relates to the art environment.

SEE OR SEARCH THIS CLASS, SUBCLASS:
117+, for high voltage dissipation devices.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 2 for lightning protection devices such as lightning rods, subclasses 5+ for electric shock hazard protection devices, such as guards, and subclasses 6+ for grounding devices.
216, Etching a Substrate: Processes, subclass 6 for etching in the manufacturing of a capacitor.
320, Electricity: Battery or Capacitor Charging or Discharging, subclasses 127+ for discharging a battery and subclasses 166+ for discharging a capacitor, per se.
343, Communications: Radio Wave, subclass 885 for antennas with a support for the antenna, reflector or director and having stress distributing or static discharging means for the support.

213 By charged gas irradiation:
This subclass is indented under subclass 212. Subject matter relating to the dissipation of a residual electric charge on or in an object or material using a charged gas.

(1) Note. Radioactive type ionization for dissipating a residual electric charge is also found in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
229, for this subject matter used in charging an object or material.
230+, for ion generators, per se.

214 Of paper or paper handling machine:
This subclass is indented under subclass 212. Subject matter relating to the dissipation of electric charge on paper or paper handling machines.

215 Of storage or hazardous area of fluid handling:
This subclass is indented under subclass 212. Subject matter relating to the dissipation of the electric charge from storage or hazardous area or fluid handling.

(1) Note. The electric charge may be eliminated from a liquid or gas by the provision of a grounding circuit to the liquid or gas carrying device.

216 Structurally combined with building or vehicle:
This subclass is indented under subclass 212. Subject matter wherein the dissipating means is attached to or an integral part of a building or vehicle.

217 With external structure of vehicle:
This subclass is indented under subclass 216. Subject matter wherein the dissipating means is attached to or an integral part of the external structure of a vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
220+, for specific dissipating devices.

218 Aircraft:
This subclass is indented under subclass 217. Subject matter wherein the vehicle is an air travel vehicle, e.g., airplanes, rockets, balloons, helicopters, etc.

(1) Note. The typical type of dissipator used is the rod type found in subclass 222.

SEE OR SEARCH THIS CLASS, SUBCLASS:
220+, for specific dissipating means.

SEE OR SEARCH CLASS:
244, Aeronautics, subclass 1 for aircraft lightning arresters and static eliminators.

219 Chain-type grounding means:
This subclass is indented under subclass 217. Subject matter wherein the electric charge is discharged from the vehicle by a flexible electroconductive chain-type member which is connected at one end to the vehicle and at the other end contacts a ground.

(1) Note. "Chain" in this subclass includes such devices as chains, cables, flexible rods with attached wheels, etc.

220 Specific conduction means or dissipator:
This subclass is indented under subclass 212. Subject matter relating to the specific device, material or circuit means used to effect discharge or prevent the accumulation of electric charge.

(1) Note. Devices adapted to be held by, attached to, or touched by a human being are classifiable herein or the indents hereunder.

221 Brush or roller-type structure:
This subclass is indented under subclass 220. Subject matter wherein the electric charge dissipator is a brush or roller means.

222 Rod-type structure:
This subclass is indented under subclass 220. Subject matter wherein the electric charge dissipator is an elongated rod-type structure having at least one point type end.

223 Shoe type:
This subclass is indented under subclass 220. Subject matter wherein the electric charge is dissipated by an electrical path through the shoes, an attachment to the shoes, or a covering over the shoes.

SEE OR SEARCH CLASS:
36, Boots, Shoes, and Leggings, for necessary shoe structure.

224 Integral with shoe:
This subclass is indented under subclass 223. Subject matter wherein the electric charge is dissipated by electrically conductive means forming a permanent part of the shoes.

225 ELECTRIC CHARGING OF OBJECTS OR MATERIALS:
This subclass is indented under the class definition. Subject matter wherein a means or method is provided for imparting an electrical charge to a material or object.

(1) Note. Where the charging of objects or materials is combined with the specific features of an art environment, the search should be made in the class which relates to the art environment.

SEE OR SEARCH CLASS:
29, Metal Working, see cross-reference art collection 900 for a method or apparatus for assembly by electrostatic attraction, which may include a step or mechanism for imposing an electrostatic charge.
204, Chemistry: Electrical and Wave Energy, especially subclasses 164+ for preparation of a compound or element through a chemical reaction

brought about by an electrostatic field or electrical discharge.

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, appropriate subclasses for this subject matter when used in electrolysis.

250, Radiant Energy, subclasses 324+ for subject matter which provides for impacting an object with gas ions resulting from an incomplete electrical discharge from an electrode.

310, Electrical Generator or Motor Structure, subclass 316.03 for a piezoelectric element having both mechanical and electric output having specific circuitry (e.g., capacitor, coil, combination etc.) to source electrons flowing to or sink electrons flowing from the piezoelectric element.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for charging a battery or capacitor.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 106+ for processes and devices for producing plasma utilized in thermonuclear reactions.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 21, 22+, and 186 for process and apparatus provided by the class using electrical energy.

226 Particulate matter (e.g., liquids with suspended particles):

This subclass is indented under subclass 225. Subject matter relating to imparting an electrical charge to minute separate particles of matter.

(1) Note. This subclass does not include gas charging, however, included in this subclass is a mixture or solution of powders which are suspended or entrained in a gas or liquid.

227 For spray production:

This subclass is indented under subclass 226. Subject matter wherein the electrical charges are imparted to a spray material.

(1) Note. Subject matter in which a particular recitation of a nozzle or spray pattern is emphasized, even though the spray is electrostatically charged, is beyond this subclass and should be placed in Class 239, subclass 15.

(2) Note. Subject matter wherein a particular relationship exists between the spray device and work sprayed upon, particular movement of the work with respect to the spray device, or vice versa, are not included in this subclass; such subject matter can be found in Class 427, subclasses 13+ and Class 118, subclasses 621+.

SEE OR SEARCH CLASS:

118, Coating Apparatus, subclasses 621+ for electrostatic spray devices with a specific relationship with respect to the work.

239, Fluid Sprinkling, Spraying, and Diffusing, subclasses 690+ for electrostatically charged spray in a particular nozzle or spray pattern.

427, Coating Processes, subclasses 458+ for processes of coating per se utilizing an electrostatic charge.

228 Liquid type:

This subclass is indented under subclass 227. Subject matter wherein an electrical charge is imparted to a liquid spray material or powder supported in a stream of liquid material.

229 By charged gas irradiation:

This subclass is indented under subclass 225. Subject matter relating to imparting an electrical charge to a material or object using a charged gas.

SEE OR SEARCH THIS CLASS, SUBCLASS:

213, for this subject matter used in discharging a material or object.

230+, for ion generators, per se.

230 ELECTRIC CHARGE GENERATING OR CONDUCTING MEANS (E.G., CHARGING OF GASES):

This subclass is indented under the class definition. Subject matter relating to corona or ion generators which utilize air or other gases as the charge generating medium to be placed in contact with the charge generating electrodes or with the specific electrodes which project the electric field generated.

(1) Note. This subclass also provides for other electric charge generating or conducting means not elsewhere provided for.

SEE OR SEARCH THIS CLASS, SUBCLASS:

213, for discharging of a material or object using a charged gas.

229, for charging of a material or object using a charged gas.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclasses 423+ for ion generation methods and apparatus in which a material is treated or irradiated.

313, Electric Lamp and Discharge Devices, subclasses 54, 62, and 359.1+ for space discharge device per se for production of ionized atomic particles. Also, consult the search notes to these subclasses for related subject matter.

231 Modification of environmental electrical charge:

This subclass is indented under subclass 230. Subject matter relating to devices or processes for altering or changing the ambient charge in a definable area or atmosphere.

SEE OR SEARCH CLASS:

96, Gas Separation: Apparatus, subclasses 15+ for electrostatic-type precipitators.

239, Fluid Sprinkling, Spraying, and Diffusing, subclass 2.1 for processes of weather control utilizing electric charge generating means.

232 For application to living beings:

This subclass is indented under subclass 230. Subject matter wherein an electric charge or voltage is produced on a material or device which will discharge to living beings causing an electrical shock to be produced in the living being when it comes into contact with or in close proximity with the charged or voltage carrying material.

SEE OR SEARCH CLASS:

119, Animal Husbandry, subclasses 712+, for application of electricity to an animal to control it, especially subclasses 822 and 908, and subclass 859 for a collar having a device to apply electricity to an animal.

231, Whips and Whip Apparatus, subclass 7 for an electrified goad for controlling the behavior or movement of an animal.

256, Fences, subclass 10 for electric fences.

463, Amusement Devices: Games, subclass 47.3 for a striking type of weapon for use on a human being which includes an electric shock feature (e.g., an electric prod used by police, etc.).

233 Use of forces of electric charge or field:

This subclass is indented under subclass 230. Subject matter relating to the utilization of the forces of the electric the utilization of the forces of the electric charge, or the forces of the electric field generated to perform a mechanical work function.

234 Pinning:

This subclass is indented under subclass 233. Subject matter relating to the utilization of the forces generated to effect the holding or pinning of an object or material on a surface.

235 With specific power supply:

This subclass is indented under subclass 230. Subject matter wherein electrical circuitry and means are provided for the production of a current or voltage which is utilized specifically for electric charge generation.

(1) Note. To be proper for this subclass, the subject matter claimed must recite pro-

cesses or means which are not provided for in any of the above subclasses. The subject matter must clearly recite circuitry for use in generating an electrical charge.

236 ELECTRICAL SPEED SIGNAL PROCESSING SYSTEMS:

This subclass is indented under the class definition. Subject matter wherein electrical circuitry is provided for detection of the speed or acceleration of a member, either angular or linear, and means included in the circuitry responsive to a change in speed or acceleration to generate a desired speed or acceleration control signal.

(1) Note. This subclass relates to, for example, miscellaneous speed sensing and speed responsive systems having no output which is specific to any particular art. This subclass relates only to speed controlled subcombinations; not speed controlled combinations.

(2) Note. Subject matter in which a combination of speed control circuitry and the device being controlled is claimed, proper classification is with the device and should not be placed in this or indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

51, for protection of electrical systems against overspeed.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 488+ for speed or accelerating measuring.

178, Telegraphy, appropriate subclasses for telegraph and television systems having speed responsive means as a part thereof.

180, Motor Vehicles, subclasses 170+ as explained in the reference thereto appearing in Class 361, subclass 51.

290, Prime-Mover Dynamo Plants, subclass 40 for prime-mover dynamo plants having means to control the speed of the engine.

318, Electricity: Motive Power Systems, appropriate subclasses for speed controlled electric motor systems. Note particularly subclasses 806 and 461+.

324, Electricity: Measuring and Testing, subclasses 160+ for electrical speed measuring processes and mechanisms.

340, Communications: Electrical, subclass 441 for vehicle alarms or indicators which are responsive to the speed of the vehicle, and subclasses 670+ for speed responsive alarms, per se.

375, Pulse or Digital Communications, subclasses 354+ for synchronization.

416, Fluid Reaction Surfaces (i.e., Impellers), subclasses 44+ for an impeller having control means responsive to the rotation speed thereof.

237 With centrifugal weight means:

This subclass is indented under subclass 236. Subject matter wherein the electrical circuitry includes a centrifugal means for regulation of the speed of acceleration of a member under consideration.

SEE OR SEARCH CLASS:

116, Signals and Indicators, subclass 38 for vehicular governors indication speed and direction.

123, Internal-Combustion Engines, subclasses 319+ for speed regulators especially subclasses 350+, 378+, and 402+.

200, Electricity: Circuit Makers and Breakers, subclasses 80+ for centrifugally operated speed responsive switches.

318, Electricity: Motive Power Systems, subclasses 799 and 462 for centrifugal type automatic speed or rate-of-movement detectors.

416, Fluid Reaction Surface (i.e., Impellers), subclasses 31+, especially subclass 35 for electrical means comparing or reducing an error responsive to centrifugal action.

238 Antislip detection and circuitry:

This subclass is indented under subclass 236. Subject matter wherein the electrical circuit contains means for determination of a loss of traction or loss of rotation condition.

(1) Note. The property usually measured is acceleration but is not limited thereto.

(2) Note. The acceleration may be a negative or position acceleration.

SEE OR SEARCH CLASS:
290, Prime-Mover Dynamo Plants, subclasses 9+ for electric control traction devices.
303, Fluid-Pressure and Analogous Brake System, subclasses 113.1+ for anti-skid systems where brakes are operated.
324, Electricity: Measuring and Testing, subclass 162 for acceleration measuring means in an electrical speed measuring device.

239 With speed analog electrical signal:
This subclass is indented under subclass 236. Subject matter wherein the speed change determining means includes circuitry for producing an analog signal which has a magnitude representative of the speed of the member.

SEE OR SEARCH CLASS:
318, Electricity: Motive Power Systems, subclasses 830 and 463+ for tachometer type automatic speed or rate-of-movement de-detectors.
324, Electricity: Measuring and Testing, subclasses 163+ for speed measuring means with speed analog electrical signal generators.

240 Including frequency generators:
This subclass is indented under subclass 236. Subject matter wherein the electrical circuit includes circuitry in which the frequency of an A.C. current or the frequency of a D.C. pulse is representative of the speed of the member.

SEE OR SEARCH CLASS:
322, Electricity: Single Generator Systems, subclasses 29+ for generator systems which are responsive to the speed or frequency of the generator.
324, Electricity: Measuring and Testing, subclasses 166+ for speed related frequency generators used to measure speed.

241 Two position (e.g., on-off):
This subclass is indented under subclass 236. Subject matter wherein the circuitry for generating the control signal includes a switch which is either on or off.

SEE OR SEARCH THIS CLASS, SUBCLASS:
242, for speed control which includes comparison means.

242 With speed comparison:
This subclass is indented under subclass 236. Subject matter wherein the electrical circuit contains means for comparing the generated signal with a reference signal.

SEE OR SEARCH CLASS:
318, Electricity: Motive Power Systems, subclass 820 for control of the speed of a motor or driven device, with respect to a master or reference device.
324, Electricity: Measuring and Testing, subclass 161 for electrical speed measuring with speed comparing means.

243 Synchronization of shafts:
This subclass is indented under subclass 236. Subject matter wherein the speed control means includes means for simultaneously controlling the rotation of two or more shafts in the same or different mechanisms.

SEE OR SEARCH THIS CLASS, SUBCLASS:
242, for speed comparison means which do not require synchronization means but may disclose such.

SEE OR SEARCH CLASS:
74, Machine Element or Mechanism, subclasses 395+ for systems for synchronizing the rotary motion of a plurality of shafts where adjustable gearing is utilized to control the rotation of at least one of the shafts.
91, Motors: Expansible Chamber Type, appropriate subclasses, and especially subclass 171 for synchronizing plural expansible chamber motors.

318, Electricity: Motive Power Systems, subclass 41 for plural electric motor systems having electrical synchronizing interconnections for maintaining synchronization between the motors, subclasses 68+ for plural electric motor systems with means for controlling the running speed of one motor relative to the speed of another motor including such systems for maintaining the motors in synchronism, and subclass 85 for the miscellaneous plural electric motor systems with synchronizing or phasing control for the motors.

340, Communications: Electrical, subclass 681 for a machine synchronization responsive indicating device; subclass 318 for miscellaneous signalling systems having synchronized distributors at the transmitter and receiver.

352, Optics: Motion Pictures, subclasses 12+ for motion picture apparatus combined with sound recording or reproducing apparatus and including means for synchronizing the two.

370, Multiplex Communications, subclasses 303+ for multiplexing systems having a rotary distributor.

375, Pulse or Digital Communications, subclasses 354+ for synchronization systems.

416, Fluid Reaction Surfaces (i.e., Impellers), subclass 34 for plural impeller having synchronizing means.

244 Phase comparison:

This subclass is indented under subclass 243. Subject matter wherein the simultaneous rotation of the shaft is controlled by a phase measuring and comparing means with one of the shafts or a given phase acting as a reference phase.

245 POLARITY REVERSING:

This subclass is indented under the class definition. Subject matter relating to the reversing of the polarity of an electric circuit.

(1) Note. This subclass relates to, for example, the reversing of polarity under the control of an external operator, or the reversing of polarity in a continuous pulsating manner.

SEE OR SEARCH CLASS:

178, Telegraphy, appropriate subclasses particularly subclass 16 for telegraph systems utilizing polarity reversing as an indication of the intelligence to be transmitted.

200, Electricity: Circuit Makers and Breakers, appropriate subclasses, particularly subclasses 19.06+ for electric switches which can be utilized to reverse polarity.

246, Railway Switches and Signals, appropriate subclasses, particularly subclasses 228, 232 and 242 for railway signalling systems utilizing polarity reversing as an indication of the intelligence to be transmitted.

307, Electrical Transmission or Interconnection Systems, subclass 151 for this subject matter, and subclasses 112+ for miscellaneous switching systems, some of which reverse polarity.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 87 for electromagnetically operated switches which may be utilized to reverse polarity.

363, Electric Power Conversion Systems, appropriate subclasses for conversion systems. Note subclass 109 for conversion systems in which direct current is converted into alternating current by the action of a switch which reverses the polarity of the output circuit.

246 Automatic:

This subclass is indented under subclass 245. Subject matter in which the polarity is reversed in accordance with an automatic control.

247 IGNITING SYSTEMS:

This subclass is indented under the class definition. Subject matter relating to electrical systems which cause the rapid combustion of a fuel or the detonation of an explosive charge.

(1) Note. The subject matter in this subclass does not include the fuel being ignited or the explosive being detonated.

SEE OR SEARCH CLASS:

123, Internal-Combustion Engines, subclasses 143+ for igniting systems utilized with internal-combustion engines.

126, Stoves and Furnaces, appropriate subclasses for solid fuel burners having igniting means.

221, Article dispensing, subclasses 143+ for article dispensers having electrical igniting means.

236, Automatic Temperature and Humidity Regulation, appropriate subclasses for complete heating systems having igniters as a portion thereof.

431, Combustion, subclasses 258+ for a fuel burner having an electrical igniter or heater.

248 For explosive devices:

This subclass is indented under subclass 247. Subject matter for detonating an explosive device.

(1) Note. Explosive devices include, for example, rockets, dynamite charges and photoflash devices.

SEE OR SEARCH CLASS:

89, Ordnance, appropriate subclasses for explosive device projecting or dropping means having igniting means as a part thereof.

102, Ammunition and Explosives, appropriate subclasses for explosive devices having igniting means as a portion thereof.

362, Illumination, subclasses 3+ for photos:graphic illumination devices including ignition means.

396, Photography, subclasses 155+ for photoflash devices combined with camera structure which may include ignition means.

431, Combustion, subclasses 357+ for photo-flash devices including ignition means.

249 With sequential firing by electronic switching:

This subclass is indented under subclass 248. Subject matter wherein plural explosive devices are ignited in a particular sequence by electronic switch means.

(1) Note. The electronic switch means includes nonmechanical devices such as vacuum tubes, transistors, SCR's, etc.

250 With sequential firing by mechanical switching:

This subclass is indented under subclass 248. Subject matter wherein plural explosive devices are ignited in a particular sequence by mechanical switch means.

251 With capacitor discharging into explosive device:

This subclass is indented under subclass 248. Subject matter wherein an explosive device is ignited by switching a charge capacitor to discharge into the device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

256, and 257, for electric spark ignition by capacitor discharge.

252 With electromechanical power source:

This subclass is indented under subclass 248. Subject matter wherein the energy for ignition of the explosive device is provided by an electromechanical generator.

(1) Note. The electromechanical generator includes dynamos, magnetos, piezoelectric devices, and other devices wherein electric power is produced through a mechanical agency.

SEE OR SEARCH THIS CLASS, SUBCLASS:

258, for particular electromechanical power source combined with electrical spark igniter.

SEE OR SEARCH CLASS:

322, Electricity: Single Generator Systems, appropriate subclasses for a particular electromechanical power source.

253 For electric spark ignition:
This subclass is indented under subclass 247. Subject matter wherein the energy for ignition is provided by a system which generates an electric spark.

SEE OR SEARCH CLASS:
313, Electric Lamp and Discharge Devices, appropriate subclasses for air gap discharge devices. See subclasses 118+ for spark plugs, per se, of the type used in internal combustion engines. See subclass 53 for flame type discharge devices in which conduction of electricity takes place through a flame.
315, Electric Lamp and Discharge Devices: Systems, appropriate subclasses for lamp and gas discharge device systems. Note, that some of these systems can be used to energize electric igniters.

254 With electromagnet control means:
This subclass is indented under subclass 253. Subject matter having electromagnetic means to control the igniter.

(1) Note. The electromagnet might also control the flow of gas to the igniter.

SEE OR SEARCH THIS CLASS, SUBCLASS:
265, for electromagnet control with incandescent ignition.

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 220+ for electromagnets with armatures.
336, Inductor Devices, appropriate subclasses for the structure of inductive devices.

255 Including spark-electrode make-break:
This subclass is indented under subclass 254. Subject matter wherein an electromagnet causes the spark electrodes to move either together or apart so as to produce a spark.

SEE OR SEARCH THIS CLASS, SUBCLASS:
261, for particular mechanical arrangements allowing for electrode movement.

256 With capacitor discharging into sparking transformer:
This subclass is indented under subclass 253. Subject matter wherein a charged capacitor is switched into circuit with and discharges into the primary of a transformer thereby inducing a voltage of sufficient magnitude in the secondary of the transformer to produce an ignition spark between two spaced electrodes in the secondary circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
251, for capacitor discharge firing or explosive devices.
257, for capacitor discharge directly into a spark gap to produce an ignition spark.

257 With capacitor discharge into spark gap:
This subclass is indented under subclass 253. Subject matter wherein a capacitor is in circuit with spark gap electrodes such that when the capacitor is sufficiently charged, an ignition spark will be produced between the electrodes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
251, for capacitor discharge firing of explosive devices.
256, for capacitor discharge into spark transformer to produce an ignition spark.

258 With electromechanical generator:
This subclass is indented under subclass 253. Subject matter wherein the energy for electric spark ignition is provided by an electromechanical generator which converts mechanical energy into electrical energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:
252, for electromechanical generator when used to ignite explosive devices.

SEE OR SEARCH CLASS:
322, Electricity: Single Generator Systems, appropriate subclasses for particular electromechanical generator.

259 With permanent magnet:
This subclass is indented under subclass 258. Subject matter wherein a magnetic field through a coil or transformer due to a permanent magnet is modulated by the action of mechanical means so as to induce a sparking voltage across electrodes connected to the coil or transformer.

260 With piezoelectric element:
This subclass is indented under subclass 258. Subject matter wherein a piezoelectric crystal is mechanically stressed so as to produce a sparking voltage across electrodes appropriately connected to the crystal.

261 With mechanical arrangement for spark-electrode make-break:
This subclass is indented under subclass 253. Subject matter including spark electrodes which are part of a mechanism which can be mechanically actuated to cause the electrodes to move into and out of contact with each other thereby producing a spark.

SEE OR SEARCH CLASS:
313, Electric Lamp and Discharge Devices, subclasses 146+ for discharge devices having moveable electrodes.

262 With one spark electrode which is hand held:
This subclass is indented under subclass 253. Subject matter wherein one of two sparking electrodes is arranged to be hand manipulated and manually brought into contact with the other electrode to thereby produce a spark.

(1) Note. Included, for example, an energized electrode with an insulated handle which can be brought into contact with a grounded gas burner to produce a spark igniting the burner.

SEE OR SEARCH CLASS:
431, Combustion, subclass 128 for hand manipulatable electric igniters for igniting fuel.

263 With spark coil or transformer:
This subclass is indented under subclass 253. Subject matter wherein the energy for the ignition spark is provided by a spark coil or transformer connected to the spark electrodes.

(1) Note. "Spark coil" includes induction coils having make-break contacts in the primary circuit.

SEE OR SEARCH CLASS:
336, Inductor Devices, appropriate subclasses for structure of coil or transformer.

264 For incandescent ignition:
This subclass is indented under subclass 247. Subject matter wherein a current is passed through an ignition element so as to heat the element to incandescence thereby causing ignition.

SEE OR SEARCH CLASS:
123, Internal-Combustion Engines, subclasses 145+ for an incandescent igniter combined with an internal-combustion engine.
219, Electric Heating, subclasses 260+ for incandescent igniting elements.

265 With electromagnet control means:
This subclass is indented under subclass 264. Subject matter having electromagnetic means to control the igniter.

(1) Note. The electromagnet may also control the flow of gas to the igniter.

SEE OR SEARCH THIS CLASS, SUBCLASS:
254, for electromagnet control of electric spark ignition.

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, appropriate subclasses for electromagnet structure.

266 With helical heating element:
This subclass is indented under subclass 264. Subject matter wherein the incandescent igniter is in the form of a helix or coil.

267 DEMAGNETIZING SYSTEMS AND PROCESSES:

This subclass is indented under the class definition. Subject matter including systems and process for neutralizing a magnetic field.

(1) Note. This subclass includes, for example, processes for demagnetizing the hair springs of a watch, etc.

(2) Note. Where the demagnetizing is combined with the specific features of the art environment, the search should extend to the class which relates to the art environment.

SEE OR SEARCH THIS CLASS, SUBCLASS:

149+, for systems and processes for neutralizing the magnetic field by means of an electromagnetic coil.

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 602.1+ for processes of making permanent magnets consisting of more than merely demagnetizing and processes of making electromagnets; also consult the extensive search notes to this subclass for a compilation of related subject matter.

114, Ships, subclass 240 for degaussing of ships.

209, Classifying, Separating, and Assorting Solids, subclass 8 for demagnetizing as a step preliminary to classifying, separating or assorting.

307, Electrical Transmission or Interconnection Systems, subclass 101 for the control of remnant or residual magnetism, and subclass 104 for electromagnet and highly inductive systems.

318, Electricity: Motive Power Systems, subclass 492 for electric motor systems having means to dissipate the magnetic energy of the electric motor.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, appropriate subclasses, especially subclass 284.

365, Static Information Storage and Retrieval, appropriate subclass for magnetic storage systems including means to demagnetize the storage medium, subclasses 185.01+ for floating gate memory storage (e.g., flash memory).

368, Horology: Time Measuring Systems or Devices, subclass 293 for antimagnetic devices utilized in horology.

268 TRANSFORMERS AND INDUCTORS WITH INTEGRAL SWITCH, CAPACITOR, OR LOCK (E.G., IGNITION COIL):

This subclass is indented under the class definition. Subject matter comprising a structural combination of a transformer or inductor with a switch, capacitor or a lock.

(1) Note. If the switch is solely for the purpose of tap changing on the transformer or inductor device, classification is not herein but rather in the appropriate subclass of Class 336.

(2) Note. This subclass relates, for example, to ignition coils having integral vibrating switches.

SEE OR SEARCH THIS CLASS, SUBCLASS:

35+, for transformer protection circuits.

SEE OR SEARCH CLASS:

216, Etching a Substrate: Processes, subclass 6 for etching in the manufacturing of a capacitor.

334, Tuners, appropriate subclasses for tuned networks for use in wave energy apparatus and comprising an inductor connected to or combined with a capacitor, either the inductor or capacitor, or both, being variable. The inductor may also be combined with a switch and for such arrangements, not especially subclasses 56+.

336, Inductor Devices, subclasses 105+ and the notes thereto, for structural combinations of a transformer or inductive reactor with other elements such as a connector; see also (1) Note, above.

363, Electric Power Conversion Systems, subclasses 13+ for conversion systems which convert direct current into alternating current. Some of these

conversion systems are analogous to spark coils.

269 With lock for preventing unauthorized use:
This subclass is indented under subclass 268. Subject matter provided with locking means to prevent unauthorized use.

(1) Note. Generally the locking means is part of a conduit or housing means in which the electromagnetic device is enclosed.

SEE OR SEARCH CLASS:
70, Locks, for locking means, per se. Note, especially subclasses 174+ for locking means for control and machine elements, and subclasses 237+ for locking means for automobile vehicles.
174, Electricity: Conductors and Insulators, appropriate subclass, particularly subclasses 17+ and 50+ for miscellaneous housings for single piece of electrical apparatus, some of which housings may be equipped with locking means.

270 With capacitor element:
This subclass is indented under subclass 268. Subject matter comprising a transformer or inductive reactor structurally combined with a capacitor.

(1) Note. If the combined capacitor constitutes an electric or magnetic shield, classification is not herein but rather in Class 336, Inductor Devices, subclasses 87+.

(2) Note. The capacitor may be provided to protect the switch contacts of an ignition coil.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271+, and 433+, for capacitors, per se.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 32+ for anti-inductive structures utilized with electrical conductors. Note, particularly indented subclasses 35+ for screened or shielded conductors.
333, Wave Transmission Lines and Networks, appropriate subclasses for electric filter devices comprising the combination of a transformer or inductive reactor and a capacitor.
334, Tuners, subclasses 59+ for a switch operated tuner which is of the tuned transformer type, the transformer usually being combined with a lumped capacitor, and subclasses 61+ for tuners having mutual inductance variable means which may be a transformer circuit.
336, Inductor Devices, and see (1) Note above.

271 ELECTROSTATIC CAPACITORS:
This subclass is indented under the class definition. Subject matter relating to an electrostatic capacitor which is an electrical device having the property that permits energy storage as a result of electron displacement, usually consisting of at least two conducting surfaces separated by a nonconducting medium (i.e., dielectric) such as a gas, liquid or solid or some combinations thereof.

(1) Note. The term condenser generally used in older patents is an old term synonymous with the term capacitor. The same comment applies to armature and electrode.

(2) Note. This subclass includes electrostatic capacitors, per se. Electrostatic capacitors combined with another art device or system are classified with the particular art device or system.

SEE OR SEARCH THIS CLASS, SUBCLASS:
433+, for electrolytic capacitors.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 25.41+ for miscellaneous methods of manufacturing capacitors. Also consult the extensive search notes to subclass 25.41 for a compilation of related art.
216, Etching a Substrate: Processes, subclass 6 for etching in the manufacturing of a capacitor.

307, Electrical Transmission or Interconnection Systems, subclass 400 for electrets, per se, and electret systems. An electret is a permanently polarized dielectric, and therefore related to a capacitor, which has a transiently polarized dielectric.

314, Electric Lamp and Discharge Devices: Consumable Electrodes, subclass 132 for arc lamps combined with any capacitor.

315, Electric Lamp and Discharge Devices: Systems, subclasses 3+ and 32+ for cathode-ray tubes, electric lamps or gas discharge devices combined with as an integral part of their structure, a capacitor.

333, Wave Transmission Lines and Networks, appropriate subclasses for miscellaneous communication type electrical networks having capacitors as part thereof.

334, Tuners, appropriate subclasses for a variable tuner comprising an inductor and a capacitor, with the inductor or capacitor being variable for changing the mean resonant frequency of the circuit.

341, Coded Data Generation or Conversation, subclass 15 for capacitive pattern reading type analog to digital converters.

272 With protection or compensating means:

This subclass is indented under subclass 271. Subject matter having means to safeguard against breakdowns or to counteract undesired operating characteristics.

(1) Note. The protective or compensative means is an integral part of the capacitor structure and significant details of the capacitor structure must be disclosed.

(2) Note. The protective or compensative means must be within or a part of the capacitor housing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15+, for capacitors combined with systems for protecting them, as for example, against lightning surges.

600+, for miscellaneous housings, switchboards and analogous devices for housing or holding two different types of electrical components, one of which, for example, may be, an electrical capacitor.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 8+ and 50+ for miscellaneous electrical housings for a single electrical component, which may be, for example, a capacitor, and subclasses 140+ for capacitors combined with insulators for the purpose of distributing the electrostatic stress uniformly along the insulator.

273 Self-healing:

This subclass is indented under subclass 272. Subject matter having means to automatically restore to working order, a malfunctioning capacitor.

(1) Note. This subclass includes, for example, a thin, metal film electrode which burns or evaporates away around the point of a puncture without damage to the capacitor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

304, for nonself-supporting electrodes (e.g., metallized).

274.1 Temperature:

This subclass is indented under subclass 272. Subject matter including means which shield against or make allowance for variations in the internal heat of the capacitor.

(1) Note. These indented subclasses relate, for example, to cooling of the capacitor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

676+, for housings and mounting assemblies with plural diverse electrical components for electrical power distribution systems and devices with means for cooling the same.

688+, for electronic systems and devices with cooling means.

SEE OR SEARCH CLASS:

165, Heat Exchange, appropriate subclasses for a heat exchange structure of a general nature.

174, Electricity: Conductors and Insulators, subclasses 15.1+ for miscellaneous boxes and housings for a single piece of electrical apparatus having means to cool the same.

236, Automatic Temperature and Humidity Regulation, appropriate subclasses for automatic temperature control systems.

454, Ventilation, appropriate subclasses for ventilating devices.

274.2 With fluid cooling means:

This subclass is indented under subclass 274.1. Subject matter including air or liquid to reduce the temperature of a capacitor below a specific level.

274.3 With heat sink:

This subclass is indented under subclass 274.1. Subject matter including means for the absorption or transfer of heat away from the inner capacitor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

514, for liquid electrolytic capacitor with heat sink.

275.1 For electrical irregularities:

This subclass is indented under subclass 272. Subject matter wherein the undesired operating characteristics are unexpected electrical discharge, corona, or short circuiting.

(1) Note. Excluded are capacitors combined with other electronic devices unless the sole purpose of the other electronic device is to protect the capacitor and the device is an integral part of the capacitor. For example, a resistor shunt integral with the capacitor structure is found here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15+, for capacitor protection for preventing current and voltage surges that are external to the capacitor housing; details to the capacitor structure are not included.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 379 through 381 and 528-543 for passive components (e.g., capacitor and resistor) in integrated chips.

323, Electricity: Power Supply or Regulation Systems, subclass 370 for plural impedance control systems; in particular, for capacitor or capacitor combined with a resistor or inductor control system.

333, Wave Transmission Lines and Networks, subclasses 167+ for wave filters; in particular, for capacitors and resistors for filtering.

275.2 With over-pressure breakaway fuse:

This subclass is indented under subclass 275.1. Subject matter comprising means composed of an electrical current conductor having a rated break point in conjunction with a capacitor winding so that the rated break point breaks due to mechanical stresses in the conductor caused by over heating of the capacitor.

275.3 With resistance element:

This subclass is indented under subclass 275.1. Subject matter comprising means including an element having a property of a conductor which determines the current produced by a given difference of potential.

SEE OR SEARCH CLASS:

323, Electricity: Power Supply or Regulation Systems, subclass 370 for thermistor or resistor with a capacitor.

338, Electrical Resistors, subclasses 296+ for helical or wound resistance element.

275.4 With thermal fuse:

This subclass is indented under subclass 275.1. Subject matter comprising a fusible alloy strip which melts upon the overheating of the capacitor thus breaking the electrical connection between the two ends of the capacitor electrodes.

SEE OR SEARCH CLASS:

337, Electricity: Electrothermally or Thermally Actuated Switches, subclasses 142+ for fusible element actuated.

276 Cryogenic:

This subclass is indented under subclass 271. Subject matter which is intended to function at temperatures near absolute zero.

SEE OR SEARCH THIS CLASS, SUBCLASS:

19, for superconductive protective circuits.

277 Variable:

This subclass is indented under subclass 271. Subject matter wherein the capacitance of the capacitor can be altered.

SEE OR SEARCH CLASS:

216, Etching a Substrate: Processes, subclass 6 for etching in the manufacturing of a capacitor.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se, especially subclass 480 for variable capacitance diodes and subclasses 595-602 for active voltage variable capacitance devices.

334, Tuners, subclasses 78+ for tuners having variable capacitors.

365, Static Information Storage and Retrieval, subclasses 102 and 149+ for memory storage capacitors.

278 With significant electrode or terminal feature:

This subclass is indented under subclass 277. Subject matter having either a distinctive electrode or terminal component.

279 Gas or vacuum dielectric:

This subclass is indented under subclass 277. Subject matter utilizing a gas or a vacuum as the dielectric within a sealed housing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

326, for gas or vacuum fixed capacitors.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 8+, especially 9 and 17+ for miscellaneous boxes and housings for a single electrical component in which the housing holds either a vacuum or a gas.

280 Responsive to external condition:

This subclass is indented under subclass 277. Subject matter in which the capacitance varies in reaction to an external condition.

(1) Note. The capacitor is designed specifically to be responsive to external conditions, for example, a diaphragm plate sensitive to pressure changes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

311+, for particular materials that may be specifically disclosed as being responsive to conditions.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclasses 116+ for condition responsive circuits in switching systems.

324, Electricity: Measuring and Testing, subclasses 658+ for systems measuring the capacity of a capacitor, and subclasses 109 and 111+ for electric meters having capacitors.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 509+ for miscellaneous external effect circuits.

332, Modulators, particularly subclasses 136 and 175 for variable capacitors used in a modulator.

340, Communications: Electrical, subclasses 500+ for condition responsive circuits in communication systems.

281 Electrical:

This subclass is indented under subclass 280. Subject matter in which the external condition is electrical, as for example, changes in the signal frequency.

282 Thermal:
This subclass is indented under subclass 280. Subject matter in which the external condition is a thermic condition.

SEE OR SEARCH CLASS:
374, Thermal Measuring and Testing, subclass 184 for an electric thermometer having a capacitive sensor.

283.1 Pressure:
This subclass is indented under subclass 280. Subject matter in which the external condition is a force per unit area.

SEE OR SEARCH CLASS:
73, Measuring and Testing, subclasses 715, 718, and 724 for capacitive fluid pressure gauge.
177, Weighing Scales, subclasses 210+ for capacitor gauges.
381, Electrical Audio Signal Processing Systems and Devices, subclass 174 for capacitive microphone.

283.2 By displacement of stylus or lever:
This subclass is indented under subclass 283.1. Subject matter in which the pressure condition is sensed by the change of position of a mechanical element or linkage which transmits force to the capacitor.

283.3 By differential capacitor:
This subclass is indented under subclass 283.1. Subject matter in which the pressure condition is sensed by two similar sets of fixed plates and one set of movable plates so arranged that when the movable plate is moved, the capacitance of one section is increased while the capacitance of the other section is decreased.

283.4 By diaphragm:
This subclass is indented under subclass 283.1. Subject matter in which the pressure condition is sensed by a flexible wall or plate.

284 Liquid level:
This subclass is indented under subclass 280. Subject matter wherein the capacitance varies in reaction to the height or level of a liquid.

SEE OR SEARCH CLASS:
73, Measuring and Testing, subclasses 304+ for capacitive liquid level gauge.

285 Fluid flow:
This subclass is indented under subclass 280. Subject matter in which the exterior condition is the flow of a fluid.

286 Humidity:
This subclass is indented under subclass 280. Subject matter in which the exterior condition is the moisture content of the surrounding medium.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclasses 664+ for variable capacitors utilizing sensing elements responsive to moisture.

287 Mechanically variable:
This subclass is indented under subclass 277. Subject matter in which the capacitance of the capacitor is mechanically variable through the application of tangible physical means.

SEE OR SEARCH CLASS:
74, Machine Element or Mechanism, subclasses 10+ for the combination of a capacitor and a dial shaft operator, such as an operator which can quickly set the capacitor into any one of a plurality of preselected positions.

288 Push button:
This subclass is indented under subclass 287. Subject matter in which the mechanical movement is initiated by depressing a button.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclass 600 for a capacitive switch, absent circuitry.
307, Electrical Transmission or Interconnection Systems, subclasses 116+ for a capacitive device controlled switching circuit.
341, Coded Data Generation or Conversion, subclass 33 for a capacitive keyboard controlled code transmitter.

289 Motor driven:
This subclass is indented under subclass 287. Subject matter in which the mechanical motion is generated by means for converting electromagnetic energy to mechanical energy.

SEE OR SEARCH CLASS:
363, Electric Power Conversion Systems, appropriate subclasses, especially subclass 140 for this subject matter utilized in electricity conversion systems.

290 By varying distance between electrodes:
This subclass is indented under subclass 287. Subject matter having means to change the interval between the electrode plates.

291 Compression type:
This subclass is indented under subclass 290. Subject matter which is varied by means to squeeze at least a portion of the electrode plates closer together.

292 By varying effective area of electrode:
This subclass is indented under subclass 287. Subject matter having means to change the capacitance of the capacitor by changing the effective area of either the electrode plates or the dielectric with respect to one another.

293 Disk trimmer:
This subclass is indented under subclass 292. Subject matter having flat, disk or segment shaped, adjoining electrode plates.

294 Direct travel piston type:
This subclass is indented under subclass 292. Subject matter having a conductive piston-like electrode in a slidable engagement with a dielectric cylinder, said cylinder being banded by at least one other electrode.

295 Piston trimmer:
This subclass is indented under subclass 292. Subject matter having a conductive piston-like electrode in a rotary screw engagement with a dielectric for capacitance adjustment, also said dielectric being banded by at least one other electrode.

296 Sliding plates:
This subclass is indented under subclass 292. Subject matter having electrode plates which variably interleaf in a rectilinear manner.

297 Spiral or helical plates:
This subclass is indented under subclass 292. Subject matter in which the electrode plates are made in the forms or helixes or spirals which variably interleaf.

298.1 Rotary plates:
This subclass is indented under subclass 292. Subject matter having electrode plates which turn and variably interleaf in a circular or orbital path about a fixed axis.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclasses 658+ for using capacitive type measurement.
334, Tuners, subclasses 78+ for variable capacitor tuner.

298.2 Details of plate feature:
This subclass is indented under subclass 298.1. Subject matter wherein structural details of an electrode plate are included.

298.3 Details of dielectric:
This subclass is indented under subclass 298.1. Subject matter wherein details of the insulating medium are included.

SEE OR SEARCH THIS CLASS, SUBCLASS:
311+, for electrostatic capacitor.
524, for solid electrolytic capacitor.

298.4 Details of electrical connecting means (e.g., terminal or lead):
This subclass is indented under subclass 298.1. Subject matter wherein structural details of an electrical connector which facilitates connection with another conductor such as a terminal or lead are included.

SEE OR SEARCH THIS CLASS, SUBCLASS:
299.2, for plural capacitor.
306.1+, for fixed capacitor.
520, for liquid electrolytic capacitor.
538, for solid electrolytic capacitor.

298.5 With adjustment means:
This subclass is indented under subclass 298.1. Subject matter including means such as a knob or lever to vary the effective area of electrodes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
299.4, for rotary plates.

299.1 Plural capacitors:
This subclass is indented under subclass 298.1. Subject matter consisting of more than one capacitor.

(1) Note. The plural capacitors may, for example, be ganged on a single shaft.

SEE OR SEARCH THIS CLASS, SUBCLASS:
328+, for multiple capacitor.
522, for multiple liquid electrolytic capacitor.
541, for multiple solid electrolytic capacitor.

299.2 Details of electrical connecting means (e.g., terminal or lead):
This subclass is indented under subclass 299.1. Subject matter wherein structural details of an electrical connector which facilitates connection with another conductor such as a terminal or lead are included.

SEE OR SEARCH THIS CLASS, SUBCLASS:
298.4, for rotary plate.
306.1+, for fixed capacitor.
520, for liquid electrolytic capacitor.
538, for solid electrolytic capacitor.

299.3 Details of mounting means:
This subclass is indented under subclass 299.1. Subject matter including details of means that serve as a support, mount, or setting.

299.4 With adjustment means:
This subclass is indented under subclass 299.1. Subject matter including means such as a knob or lever to vary the effective area of electrodes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
298.5, for rotary plate adjustment means.

299.5 Details of insulator feature:
This subclass is indented under subclass 299.1. Subject matter wherein details of a structure made of a material of low electrical conductivity designed for supporting a conductor, while physically and electrically separating it from another conductor, are included.

300 With controlling or indicating means:
This subclass is indented under subclass 287. Subject matter combined with means for regulating or visibly registering the changes of capacitance.

SEE OR SEARCH CLASS:
74, Machine Element or Mechanism, subclasses 10+ for dial shaft operators, such as, for example, an operator for setting a capacitor into any one of plural preselected positions.
116, Signals, and Indicators, subclasses 241+ and 284+ for miscellaneous indicators for indicating the position of a variable capacitor.

301.1 Fixed capacitor:
This subclass is indented under subclass 271. Subject matter wherein the capacitor has a fixed value of capacitance (i.e., invariable).

(1) Note. While all fixed capacitors may vary to some extent because of operating conditions or the ambient atmosphere, they are still fixed capacitors.

SEE OR SEARCH THIS CLASS, SUBCLASS:
277+, for variable capacitors.

301.2 Special shape (e.g., "bypass" type):
This subclass is indented under subclass 301.1. Subject matter wherein the physical shape of the capacitor is designed to conform to or fit the physical shape of another electronic element or device.

301.3 Encapsulated:
This subclass is indented under subclass 301.1. Subject matter wherein the capacitor is embedded, potted, or molded in a material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
539, for potted casing of solid electrolytic capacitor.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 52.2 for potted or encapsulated housing.

301.4 Stack:
This subclass is indented under subclass 301.1. Subject matter consisting of alternate conducting and insulating planar sheets.

301.5 Wound:
This subclass is indented under subclass 301.1. Subject matter wherein the capacitor is a spiral of alternate conducting and dielectric sheets.

SEE OR SEARCH THIS CLASS, SUBCLASS:
321.6, for tubular capacitor.
511+, for liquid electrolytic capacitor.
530+, for solid electrolytic capacitor.

302 Feed through:
Subject matter under subclasses 301.1+ wherein the capacitor is of tube or disc type and has a lead through wire.

SEE OR SEARCH THIS CLASS, SUBCLASS:
307, for lead extending into body of capacitor.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 143 for bushing condensers combined.
333, Waves Transmission Lines and Networks, subclasses 167+ for filters of RC type.

303 Significant electrode feature:
Subject matter under subclasses 301.1+ with significant details of the capacitor electrodes.

SEE OR SEARCH CLASS:
427, Coating Processes, subclasses 79+ for processes of coating electrodes, utilized in making capacitors.
438, Semiconductor Device Manufacturing: Process, particularly subclasses 386+ for methods of making a trench capacitor, subclasses 393+ for methods of making a planar capacitor, and subclasses 396+ for methods of making a stacked capacitor utilizing a semiconductor substrate.

304 Non-self-supporting electrodes:
This subclass is indented under subclass 303. Subject matter wherein the electrode is non-self-supporting (e.g., metallized on a base or liquid electrode).

SEE OR SEARCH THIS CLASS, SUBCLASS:
273, for metallized electrodes in self-healing capacitors.
305, for metallized materials.

SEE OR SEARCH CLASS:
106, Compositions: Coating or Plastic, subclass 1.05 for metallizing compositions, per se.

305 Material:
This subclass is indented under subclass 303. Subject matter where significant details of the electrode materials are involved.

(1) Note. The details of the materials can be alloys, mixtures or layers of conductive materials. The mere inclusion of a single conventional electrode material such as aluminum, tin or copper alone is not a significant detail.

SEE OR SEARCH CLASS:
75, Specialized Metallurgical Processes, Compositions for Use Therein, Consolidated Metal Powder Compositions, and Loose Metal Particulate Mixtures, subclasses 122.1+ for alloys, per se.
252, Compositions, subclasses 512+ for electrically conductive metal compositions.
420, Alloys or Metallic Compositions, alloys, per se.

306.1 Details of electrical connection means (e.g., terminal or lead):
This subclass is indented under subclass 301.1. Subject matter wherein structural details of an electrical connector which facilitates connection with another conductor such as a terminal or lead are included.

(1) Note. In some cases, the words terminal and lead are synonymous words meaning the same structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
298.4, for rotary plates capacitor.
299.2, for plural capacitor.
306.1+, for fixed capacitor.
520, for liquid electrolytic capacitor.
538, for solid electrolytic capacitor.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 50+ for housing or box terminals.
336, Inductor Devices, subclass 192 for inductor terminals.
338, Electrical Resistors, subclass 322 for resistor terminals.
427, Coating Processes, subclasses 79+ for processes of coating electrodes utilized in making capacitors.
439, Electrical Connectors, appropriate subclasses for connectors, per se, subclasses 607+ for condenser connector having capacitive shield and subclass 620 for filter connectors.

306.2 For decoupling type capacitor:
This subclass is indented under subclass 306.1. Subject matter wherein the electrical connection means is placed inside the capacitor to prevent unwanted, harmful interference from an external source.

SEE OR SEARCH THIS CLASS, SUBCLASS:
403, for printed circuit board mounting pad.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 52.4 for flat housing for electronic devices.

306.3 For multilayer capacitor:
This subclass is indented under subclass 306.1. Subject matter wherein the electrical connection means is associated with the capacitor consisting of a plurality of laminae with each of the laminae including a conductive plate portion and a nonconductive sheet portion.

SEE OR SEARCH THIS CLASS, SUBCLASS:
321.2, for multilayer ceramic capacitor.

307 Lead extends into body of capacitor:
Subject matter under subclasses 306.1+ wherein the lead extends into the body of the capacitor (e.g., tab type).

(1) Note. For classification in this subclass, the lead must extend into the electrical portion of the capacitor. Extension of the lead into the case or housing alone is not structure proper for this subclass.

308.1 Lead attached to edge of capacitor:
Subject matter under subclasses 306.1+ wherein the lead is physically attached to the edge or end portion of the capacitor electrode of an extended foil-type capacitor.

(1) Note. An extended foil capacitor is a capacitor where the electrodes extend beyond the dielectric for lead connection.

SEE OR SEARCH THIS CLASS, SUBCLASS:
310, for the lead may be wrapped or extended around the edge of the capacitor.

308.2 Cap:
This subclass is indented under subclass 308.1. Subject matter wherein the lead comprises a cup-shaped element.

308.3 Wire:
This subclass is indented under subclass 308.1. Subject matter wherein the lead comprises a slender, stringlike piece or filament of metal.

309 Metallized terminal:
Subject matter under subclasses 308.1+ wherein the terminal is a layer or layers formed

by spraying, dipping, etc., conductive material to form the terminal.

310 Lead extends around at least a portion of capacitor:
Subject matter under subclasses 306.1+ wherein the lead is wrapped or extends around the capacitor (e.g., the metal case of the capacitor is a lead).

311 Solid dielectric:
Subject matter under subclasses 301.1+ wherein the capacitor has at least one solid dielectric.

(1) Note. The inclusion of an impregnant in fluid form combined with the solid dielectric is not excluded here.

SEE OR SEARCH CLASS:
106, Compositions: Coating and Plastic, appropriate subclasses for nonresinous electric insulating material.
252, Compositions, subclass 567 for a web or sheet impregnated with a designated dielectric liquid.
427, Coating Processes, subclasses 79+ for processes of coating utilized in making capacitors.
438, Semiconductor Device Manufacturing: Process, particularly subclasses 386+ for methods of making a trench capacitor, subclasses 393+ for methods of making a planar capacitor, and subclasses 396+ for methods of making a stacked capacitor utilizing a semiconductor substrate.
520, Synthetic Resins or Natural Rubbers, for a solid dielectric composition containing a synthetic resin or natural rubber.

312 Plural dielectrics:
This subclass is indented under subclass 311. Subject matter where the solid dielectric is combined with another separate and distinct dielectric either liquid, solid, or gas.

(1) Note. The separate dielectric may be a distinct portion of the same dielectric (e.g., plural layers of the same material).

313 Layered:
This subclass is indented under subclass 312. Subject matter wherein the plural dielectrics are layered one upon the other.

(1) Note. Excluded are impregnated capacitors even though the impregnant is claimed coated on the solid dielectric. Impregnated capacitors are in subclasses 314+.

314 Impregnated:
This subclass is indented under subclass 312. Subject matter wherein the additional dielectric is an impregnant.

(1) Note. An impregnant is a gas, liquid, or solid that is placed into a capacitor to fill air voids.

SEE OR SEARCH THIS CLASS, SUBCLASS:
327, for liquid dielectrics.

315 With specific impregnant:
This subclass is indented under subclass 314. Subject matter with a specific named impregnant.

316 Including wax:
This subclass is indented under subclass 315. Subject matter wherein the specific impregnant includes a wax.

SEE OR SEARCH THIS CLASS, SUBCLASS:
317, for wax containing halogen (e.g., halowax).

317 Including halogen (e.g., chlorinated):
This subclass is indented under subclass 315. Subject matter wherein the impregnant is halogen containing (e.g., chlorinated diphenyl).

SEE OR SEARCH CLASS:
252, Compositions, subclasses 570 and 581 for halogen containing dielectrics.

318 With stabilizer or modifying substance:
This subclass is indented under subclass 317. Subject matter wherein a stabilizer or modifier is added to the dielectric to improve operating properties of the capacitor.

(1) Note. A stabilizer is used, for example, to prevent oxidation or to scavenge extraneous products produced during operation (e.g., hydrogen chloride).

(2) Note. The stabilizer or modifying substance may be added to the impregnant or the solid dielectric.

319 With stabilizer or modifying substance:
This subclass is indented under subclass 314. Subject matter wherein a stabilizer or modifier is added to the dielectric to improve the operating properties of the capacitor.

(1) Note. The stabilizer or modifier may be, for example, antioxidant or scavenger and be added to the impregnant or the solid dielectric.

320 Ceramic and glass:
This subclass is indented under subclass 312. Subject matter wherein the plural dielectric is a ceramic and glass.

(1) Note. The ceramic is usually combined in a glass matrix or the glass is used as a bonding agent for the ceramic.

SEE OR SEARCH CLASS:
501, Compositions: Ceramic, appropriate subclasses for ceramic and glass compositions.

321.1 Ceramic, glass, or oxide particles:
This subclass is indented under subclass 311. Subject matter wherein the solid dielectric is made of clay, frit, or a compound containing oxygen.

(1) Note. The terms glass, ceramic, or oxide, at times, are used synonymously in the art.

(2) Note. Also included are vitreous enamels.

SEE OR SEARCH CLASS:
501, Compositions: Ceramic, appropriate subclasses for ceramic and glass compositions.

321.2 With multilayer ceramic capacitor:
This subclass is indented under subclass 321.1. Subject matter wherein the capacitor has several thin, parallel layers of ceramic, glass, or oxide particles each separating an opposing pair of electrode surfaces.

SEE OR SEARCH THIS CLASS, SUBCLASS:
306.3, for multilayer capacitor.

321.3 Including metallization coating:
This subclass is indented under subclass 321.2. Subject matter including a thin film pattern of conductive material on the dielectric to provide interconnection of the capacitor components or to provide conductive contacts for interconnections.

321.4 Composition:
This subclass is indented under subclass 321.2. Subject matter wherein the material of the constituents of the dielectric is specified.

SEE OR SEARCH THIS CLASS, SUBCLASS:
321.5, for ceramic, glass, or oxide particles.

321.5 Composition:
This subclass is indented under subclass 321.1. Subject matter wherein the material of the constituents of the dielectric is specified.

SEE OR SEARCH THIS CLASS, SUBCLASS:
321.4, for multilayer capacitor's ceramic, glass, or oxide particles.

321.6 With tubular capacitor:
This subclass is indented under subclass 321.1. Subject matter wherein the capacitor is shaped like a hollow, elongated cylinder.

322 Oxide film:
Subject matter under subclasses 321.1+ wherein the dielectric is an oxide film on the capacitor electrode.

(1) Note. The oxide film may have been formed by oxidizing or anodizing the electrode.

SEE OR SEARCH CLASS:
205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, subclasses 80+ for anodized products and processes.

323 Plastic:
This subclass is indented under subclass 311. Subject matter wherein the solid dielectric is a synthetic polymer (i.e., plastic), (e.g., polyethylene, silicone, polypropylene).

324 Fibrous or fabric (e.g., paper, etc.):
This subclass is indented under subclass 311. Subject matter wherein the solid dielectric is a fibrous or fabric material (e.g., cellulose paper).

SEE OR SEARCH THIS CLASS, SUBCLASS:
323, for papers made of synthetic materials (e.g., plastic).

SEE OR SEARCH CLASS:
162, Paper Making and Fiber Liberation, subclass 138 for electrical insulating paper.

325 Mica:
This subclass is indented under subclass 311. Subject matter wherein the solid dielectric is mica.

(1) Note. The mica may be a synthetic material.

326 Vacuum or gas dielectric:
Subject matter under subclasses 301.1+ wherein the dielectric is a vacuum, or gas (e.g., compressed air).

(1) Note. Excluded here are gas impregnants which are found in subclasses 314+.

(2) Note. This subclass is exclusively for fixed capacitors as defined in subclasses 301.1+ with gas dielectric. Usually the gas capacitor is in a sealed housing.

(3) Note. Gas by definition includes mixtures of gas including the ambient air.

SEE OR SEARCH THIS CLASS, SUBCLASS:
279, for variable capacitors with gas or vacuum dielectrics.

SEE OR SEARCH CLASS:
216, Etching a Substrate: Processes, subclass 6 for etching in the manufacturing of a capacitor.
252, Compositions, subclass 571 for gaseous dielectric compositions, per se.

327 Liquid dielectric:
Subject matter under subclasses 301.1+ wherein the dielectric is a liquid.

(1) Note. Excluded are impregnated capacitors which are found in subclass 314.

SEE OR SEARCH CLASS:
252, Compositions, subclasses 570+ for liquid dielectric and insulating compositions.

328 Multiple capacitors:
Subject matter under subclasses 301.1+ wherein there are a plurality of capacitors.

(1) Note. The plurality of capacitors may be in a single package (e.g., roll).

(2) Note. Details of the capacitor must be included.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for a fixed capacitor combined with a variable capacitor.
299.1+, for plural rotary capacitor.
331, for mounted plural capacitors with no significant capacitor structure.

SEE OR SEARCH CLASS:
323, Electricity: Power Supply or Regulation Systems, subclass 364 for plural impedance systems.

329 Distinct physically:
This subclass is indented under subclass 328. Subject matter wherein the capacitors are separate fixed capacitors.

(1) Note. The capacitors may be of the same type.

330 Shared Electrode:
This subclass is indented under subclass 328. Subject matter wherein the multiple capacitors are formed with at least one shared electrode common to two other electrodes.

(1) Note. Also included in this class are float electrodes. A float electrode is an electrode that is not connected to a lead but is common to two other electrodes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
272, and 275.1+, for complete search of float electrodes.

SEE OR SEARCH CLASS:
333, Wave Transmission Lines and Networks, subclass 24 for capacitive coupling networks.

434 Systems (e.g., plural cells, standby exciting voltage):
Subject matter under subclasses 500+ comprising an electrolytic system not otherwise classified.

(1) Note. This subclass includes, for example, systems of plural cells arranged in series or in parallel, or to cells having plural electrodes, some of which are connected to a source of standby voltage while others of which are connected to the operating voltage.

(2) Note. The search should extend to the class which relates to the environment in which the system might be found.

435 Current interruption type (e.g., circuit breaker, D.C.-to-pulse converters):
Subject matter under subclasses 500+ of the type which is utilized for interrupting a circuit.

(1) Note. This subclass relates, for example, to electrolytic cells which interrupt the current flow through them when it exceeds a predetermined maximum and to electrolytic cells which rapidly chop a current that passes through them.

SEE OR SEARCH CLASS:
200, Electricity: Circuit makers and Breakers, subclasses 196+, 200+, and 205+ for fluid type periodic electric switches.
307, Electrical Transmission or Interconnection Systems, subclass 132 for repetitive make or break type of switching systems, some of which may utilize an electrolytic interrupter.
363, Electric Power Conversion Systems, appropriate subclasses for conversion systems utilizing electrolytic type interrupters.

436 Rectifiers:
Subject matter under subclasses 500+ for use as rectifiers.

437 MISCELLANEOUS:
This subclass is indented under the class definition. Subject matter which is not provided for in any of the preceding subclasses of this class.

500 ELECTROLYTIC SYSTEMS OR DEVICES:
This subclass is indented under the class definition. Subject matter wherein the conduction of electricity is accompanied by chemical action.

(1) Note. This and indented subclasses include for example, electrolytic condensers, interrupters or rectifiers.

SEE OR SEARCH THIS CLASS, SUBCLASS:
122, for this subject matter when used as a high voltage dissipator or lightening arrester.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 25.01+ for the manufacture of the devices in this and indented subclasses. Also, consult the search notes to subclasses

25.01+ of Class 29 for a compilation of the classes that have related art.

136, Batteries: Thermoelectric and Photoelectric, appropriate subclasses for this subject matter utilized to produce electricity by electrochemical action.

174, Electricity: Conductors and Insulators, subclasses 50+ for boxes and housings useful to encase the electrolytic devices of this and indented subclasses, and subclasses 140+ for this subject matter combined with insulators so as to distribute the voltage stress on the insulator.

204, Chemistry: Electrical and Wave Energy, subclasses 194+ for electrolytic devices utilized to produce chemical change, (e.g., electroplating cells, etc.) and subclasses 400+ for electrolytic analysis and testing devices (e.g., pH cells, etc.).

216, Etching a Substrate: Processes, subclass 6 for etching in the manufacturing of a capacitor.

252, Compositions, subclass 62.2 for electrolytic compositions for electrical devices, and subclass 62.3 for barrier layer device compositions.

314, Electric Lamp and Discharge Devices: Consumable Electrodes, subclass 132 for arc lamps having electrolytic resistance.

320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclass for charging or discharging an electrolytic capacitor or an electrolytic cell.

322, Electricity: Single Generator Systems, subclass 79 for the control of the generator circuit by the use of electrolytic impedances.

324, Electricity: Measuring and Testing, subclasses 425+ for electrolytic testing systems, (e.g., PH measuring systems).

329, Demodulators and Detectors, subclass 347 for electrolytic type demodulators or detectors.

338, Electrical Resistors, subclasses 80+ for mechanically variable liquid resistors and subclass 222 for fixed value liquid resistors.

363, Electricity Power Conversion Systems, appropriate subclasses for rectifying systems utilizing electrolytic rectifiers.

429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, appropriate subclasses for battery electrolytic compositions.

501 Coulometer (i.e., electrochemical timer):
This subclass is indented under subclass 500. Subject matter including an electrolytic cell for measuring a quantity of electricity by the chemical action produced.

SEE OR SEARCH CLASS:

324, Electricity: Measuring and Testing, subclasses 76.11+ for electricity meter, particularly subclass 94 for electrolytic device.

502 Double layer electrolytic capacitor:
This subclass is indented under subclass 500. Subject matter including: 1. a pair of paste electrodes, 2. a separator which functions both as an electronic insulator and a conductor, and 3. an electrolyte disposed within the pores of the separator.

503 Liquid electrolytic capacitor:
This subclass is indented under subclass 500. Subject matter including: 1. an anode, 2. a cathode, 3. a separator or an insulator which separates the anode and the cathode, and 4. a liquid electrolyte.

SEE OR SEARCH CLASS:

29, Metal Working, subclass 25.03 for the method of making electrolytic-type device.

504 With significant electrolyte:
This subclass is indented under subclass 503. Subject matter including significant chemical compositions.

SEE OR SEARCH CLASS:

252, Compositions, subclasses 62.2+ for the composition of electrolytes for electrical condensers and rectifiers.

429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclasses 188+ for battery electrolytes.

505 Salt solute:
This subclass is indented under subclass 504. Subject matter including a salt material which mixes with or dissolves in a solvent.

506 Ethylene glycol:
This subclass is indented under subclass 504. Subject matter including an ethylene glycol material which mixes with or dissolves in a solvent.

507 With depolarizer:
This subclass is indented under subclass 504. Subject matter including a chemical used to prevent the formation of hydrogen bubbles at the positive electrode.

(1) Note. A depolarizer is sued to improve conductivity.

508 Anode type electrode:
This subclass is indented under subclass 503. Subject matter including a specific anode type electrode structure.

(1) Note. An electrolytic anode type electrode is an electrode at which negative ions are discharged, or positive ions are formed, or at which other oxidizing reaction occurs.

509 Aluminum or tantalum:
This subclass is indented under subclass 508. Subject matter wherein the anode type electrode is made of aluminum or tantalum material.

510 Anode riser:
This subclass is indented under subclass 508. Subject matter wherein significant details of an anode electrical connection means (e.g., terminal or lead) are disclosed.

511 Wound:
This subclass is indented under subclass 508. Subject matter wherein the anode type electrode is made by winding foils together with dielectric material.

(1) Note. The anode type electrode is generally in flat, rolled, wound or tubular shape.

512 With separator:
This subclass is indented under subclass 511. Subject matter including at least one separator or spacer between winding foil electrodes.

513 With mounting means (e.g., anchoring means or clamping):
This subclass is indented under subclass 511. Subject matter wherein an anchoring means is used for securing the electrical components within the capacitor housing to prevent relative movement therebetween.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 50.54+ for means for mounting an electrical device to a box or housing.
313, Electric Lamp and Discharge Devices, subclasses 238+ for mounting the electrodes of a lamp or electric space discharge device.

514 With heat conductor (e.g., heat sink):
This subclass is indented under subclass 511. Subject matter including means to absorb or dissipate heat.

515 With common conductor (e.g., stripline):
This subclass is indented under subclass 511. Subject matter wherein the wound anode type electrode has a common conductor or stripline.

(1) Note. A stripline is a form of terminal in which the ends of the devices winding are brought out to terminal strips mounted integral with the device form or assembly.

516 Cathode type electrode (e.g., cathode casing):
This subclass is indented under subclass 503. Subject matter wherein a specific cathode structure is disclosed.

(1) Note. An electrolytic cathode is an electrode at which positive ions are discharged, or negative ions are formed, or at which other reducing reaction occur.

(2) Note. Most of the electrolytic cathodes in this subclass are formed as outer cas-

ing of the electrolytic capacitor assembly.

517 Casing:
This subclass is indented under subclass 503. Subject matter including specific details of casing which contains the liquid electrolytic capacitor components.

518 With hermetic seal:
This subclass is indented under subclass 517. Subject matter wherein the casing of liquid electrolytic capacitor components is hermetically sealed.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 50+ for hermetic sealed envelope type.

519 With header, cover, or endseal:
This subclass is indented under subclass 517. Subject matter wherein an open end of the electrolytic capacitor casing is closed by a header, cover, or endseal.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 52.5 for header, mounting stud.
215, Bottles and Jars, subclasses 43+, 50+, and 200 for closures for bottles and jars.
220, Receptacles, subclasses 200+ for closure for receptacles.
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se, especially subclasses 678+ for active solid- state device housings, in general.

520 Significant electrical connection means (e.g., terminals or leads):
This subclass is indented under subclass 519. Subject matter wherein significant details of electrical connection means (e.g., terminals or leads) are disclosed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
306.1+, for significant details of electrical terminals or leads.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 50.52+ for electrical terminals or leads.

521 With vent means:
This subclass is indented under subclass 517. Subject matter including means to release excess pressure occurring within the casing of electrolytic capacitor components.

SEE OR SEARCH CLASS:
215, Bottles and Jars, subclasses 307+ for venting bottles and jars.
220, Receptacles, subclasses 367.1+ for venting in closure.
429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclasses 82+ venting structure for batteries.

522 Multiple capacitors:
This subclass is indented under subclass 503. Subject matter including two or more liquid electrolytic capacitors.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for a fixed capacitor combined with a variable capacitor.
299.1+, for plural rotary capacitor.
600, for mounted plural capacitor with no significant capacitor structure.

523 Solid electrolytic capacitor (e.g., dry electrolytic capacitor):
This subclass is indented under subclass 500. Subject matter including capacitor in which a dielectric is primarily an anodized coating on one electrode, with the remaining space between the electrodes filled with a solid semiconductor, or paste or gel.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 25.03 for the method of making an electrolytic-type device.

524 Dielectric:
This subclass is indented under subclass 523. Subject matter including specific details of the solid dielectric material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
311+, for solid dielectric of fixed capacitor.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 25.42 for the method of making a solid dielectric condenser.

525 With significant electrolyte or semiconductor:
This subclass is indented under subclass 523. Subject matter including specific details of the solid electrolyte or the semiconductor material.

526 Paste or gel:
This subclass is indented under subclass 525. Subject matter including an electrolyte which is a colloidal solution of liquid in a solid.

SEE OR SEARCH CLASS:
204, Chemistry: Electrical and Wave Energy, subclass 414 for gel electrolyte.
429, Chemistry: Electrical Current Producing Apparatus, Product, and Process, subclasses 134 and 300+ for gel electrolyte.
516, Colloid Systems and Wetting Agents; Subcombinations Thereof; Processes of Making, Stabilizing, Breaking, or Inhibiting, subclasses 98+ for colloid systems of continuous or semicontinuous solid phase with discontinuous liquid phase (gels, pastes, flocs, coagulates) or agents for such systems or making or stabilizing such systems or agents, when generically claimed or when there is no hierarchically superior provision in the USPC for the specifically claimed art.

527 Organic salt (e.g., TCNQ):
This subclass is indented under subclass 525. Subject matter wherein the solid electrolyte or solid semiconductor material includes an organic salt or TCNQ.

528 Anode type electrode:
This subclass is indented under subclass 523. Subject matter including a specific anode type electrode structure.

529 Aluminum or tantalum:
This subclass is indented under subclass 528. Subject matter wherein the anode type electrode is made of aluminum or tantalum material.

530 Wound:
This subclass is indented under subclass 528. Subject matter wherein the anode type electrode is made by winding foils together with dielectric material.

(1) Note. The anode type electrode is generally in flat, rolled, wound or tubular shape.

531 With lead conductor:
This subclass is indented under subclass 530. Subject matter including a conductor for connecting the wound electrode to external conductors.

532 Cathode type electrode:
This subclass is indented under subclass 523. Subject matter wherein a specific cathode structure is disclosed.

533 With significant lead:
This subclass is indented under subclass 532. Subject matter wherein a specific conductor structure for connecting the cathode to an external conductor is disclosed.

534 With protection means:
This subclass is indented under subclass 523. Subject matter including means to safeguard against breakdown or short circuiting of the solid electrolytic capacitor.

(1) Note. The protection means is an integral part of the solid electrolytic capacitor structure and significant details of the structure must be disclosed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
272+, for protection or compensating means for electrostatic capacitor.

535 Casing:
This subclass is indented under subclass 523. Subject matter including specific details of the casing which contains the solid electrolytic capacitor components.

536 With hermetic seal:
This subclass is indented under subclass 535. Subject matter wherein the casing is hermetically sealed.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 50+ for hermetic sealed enveloped type.

537 With header, cover, or endseal:
This subclass is indented under subclass 535. Subject matter wherein an open end of the solid electrolytic capacitor casing is closed by a header, cover, or endseal.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 52.5 for header, mounting stud.
215, Bottles and Jars, subclasses 43+, 50+, and 200 for closures for bottles and jars.
220, Receptacles, subclasses 200+ for closure for receptacles.
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for active solid-state semiconductor devices, per se, especially subclasses 678+ for active solid- state device housings, in general.

538 Significant electrical connection means (e.g., terminals or leads):
This subclass is indented under subclass 537. Subject matter wherein significant details of electrical connection means (e.g., terminals or lead) are disclosed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
306.1+, for significant details of electrical terminals or leads.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 50.52+ for electrical terminals or leads.

539 With potting:
This subclass is indented under subclass 537. Subject matter wherein a space between the casing and the electrolytic capacitor components is occupied by a solid or semisolid mass of insulating material; or wherein the electrolytic capacitor components directly encapsulated in a mass of insulating material in the casing.

SEE OR SEARCH THIS CLASS, SUBCLASS:
600+, for plural components which are potted or encapsulated.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 841 and 855+ for process of conductor or circuit manufacturing involving encapsulating or potting of electrical components.
174, Electricity: Conductors and Insulators, subclass 52.2 for potting of electrical components, per se.
264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclasses 272.11+ for processes of encapsulating electrical components.
336, Inductor Devices, subclass 96 for potted inductor devices wherein some significant details of the inductor device is claimed.
338, Electrical Resistors, subclass 269 and 275 for resistors with molded casings or housings.

540 With terminal:
This subclass is indented under subclass 523. Subject matter wherein a specific conductor structure for connecting the solid electrolytic capacitor to external conductors is disclosed.

541 Multiple capacitors:
This subclass is indented under subclass 523. Subject matter including two or more liquid electrolytic capacitors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271, for a fixed capacitor combined with a variable capacitor.

299.1+, for plural rotary capacitor.

600, for mounted plural capacitor with no significant capacitor structure.

600 HOUSING OR MOUNTING ASSEMBLIES WITH DIVERSE ELECTRICAL COMPONENTS:

This subclass is indented under the class definition. Subject matter comprising (a) housings, boxes, panels, or mounting arrangements with an electrical device, multiple electrical devices, or diverse electrical components or (b) housing or mounting arrangements with keyboards, CRTs, disk drive units, displays, or computer related equipment which inherently have diverse electrical components.

(1) Note. This subclass includes electrical housing or mounting assemblies where the combination is not provided for in any other class or in any other subclass in this class.

(2) Note. Nominal recitation of devices in conjunction with housings or mounting arrangements, without device structural details, are classified in this class.

(3) Note. Housing or mounting assemblies in combination with structural details, functional details, or equipment descriptions, of a particular art device, are classified with the art device.

(4) Note. Support equipment or housings for computer and computer related equipment will be classified in this class, if nominal recitation of the computer or computer related equipment is recited with no data processing or calculating procedures.

(5) Note. The term “computer means” or “data processing means” will be understood as nominal recitation whenever claims do not recite details for calculating or data processing.

(6) Note. Computer related equipment comprises memory unit or equipment, data processors, data input/output controllers, data input/output units, and arithmetic units.

(7) Note. Support equipment or housings for disk drives, keyboards, display units, and CRTs without particular equipment description or functional detail for a disk drive, keyboard, display unit, or CRT, will be classified in this class.

(8) Note. Housings with printed circuit and diverse electrical components or devices are classified in this class.

(9) Note. Recitations drawn to integrated circuitry, semiconductor device or package, silicon chip, hybrid device, pellet, disk type device, flip chip, etc., without structural or functional limitations defining topology or details of the semiconductor devices will be treated as diverse components and are classified in this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

115+, for specific circuit breaker structure with protection and safety system or device.

142, for electromagnetic control circuit devices including housing.

SEE OR SEARCH CLASS:

33, Geometrical Instruments, subclasses 568+ for gauge work support adjustment, subclass 572 for gauge probe support, and subclass 573 for gauge work support.

73, Measuring and Testing, subclass 756 for fluid pressure gauge mounting and connection.

84, Music, appropriate subclasses for musical instrument(s) with cases or supports. For instrument supports of general application not claimed in combination with musical instruments or structurally limited to use with specific musical instruments, see Class 248, Supports, appropriate subclasses.

174, Electricity: Conductors and Insulators, subclasses 50+ for boxes and housings with insulator or conductor structure, subclasses 250+ for printed circuits, per se, and subclass 260 for printed circuit(s) with one component or plural same components. A printed circuit with diverse components is classified in Class 361, appropriate subclass.

181, Acoustics, subclasses 148+ for diaphragm and enclosure, subclasses 171+ for diaphragm mounting or suspension means, and subclasses 198+ for housing or enclosure of mechanical sound-modifying means.

200, Electricity: Circuit Makers and Breakers, subclasses 5+ for similar type switches arranged in keyboard manner. Class 200 is the generic class for devices having structural detail of closing or opening electrical circuits. Arrangement of circuit breakers, mounting of circuit breakers, or housing of circuit breakers are classified in Class 361, subclasses 600+.

211, Supports: Racks, subclasses 71.01+ for receptacle support type racks.

219, Electric Heating, appropriate subclasses for heater-unit with housing, casing, or support means.

220, Receptacles, subclass 3.9 for outlet or junction box type receptacle with support.

235, Registers, subclass 145 for support equipment and housings for keyboards comprising those portions of registers, usually manually actuated, including key, shift keys, space bars, etc., which control and initiate the action of the calculating machine to determine what numbers shall be introduced and how. Also to control subsidiary operation of the machine.

248, Supports, subclasses 637+ for machinery support excluding machinery structure. If machinery is recited, supports are classified with the art device.

250, Radiant Energy, subclass 239 for photocell (circuits and apparatus) housings, subclasses 453.1+ for nonsignalling objects of irradiation supports and subclass 522.1 for radiation source supports.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 678+ for housing with details to specific materials, construction or topology of a semiconductor device, or integrated circuits such as barrier layer structure, specific semiconductor contact arrangements and P/N junctions, and subclasses 701+ for insulating support details in combination with semiconductor device specifics. Class 257 also provides for housings wherein (a) the housing is for an active solid state device, details of which are positively recited in the claims, or (b) wherein the recited housing is necessary to make a usable active solid state device whether the active solid state device is recited nominally or in detail. Otherwise, housing with nominally recited active solid state active device will be classified in Class 361. Claims that contain only nominal recitations of integrated circuitry, semiconductor devices or packages, silicon chips, hybrid devices, pellets, disk type devices, flip chip bonds, etc., with no significant structural or functional details will be classified in Class 361. If a claim recites significant details of active semiconductor devices; e.g., specific materials, topological details, specific contacts, junctions, etc., along with a housing assembly, in general, the claims will be properly classified in Class 257. If significant contact structure of an active semiconductor device is recited, it will be classified in Class 257.

307, Electrical Transmission or Interconnection Systems, subclasses 9.1+ for vehicle mounted systems and subclasses 147+ for conductor arrangements or structure.

310, Electrical Generator or Motor Structure, subclass 42 for rotary dynamoelectric machinery with assembling, metal casting, or machining feature; subclass 89 for housings, windows, or covers of rotary dynamoelectric machinery having mechanical shields

or protectors; and subclasses 348+ for non-dynamoelectric piezoelectric elements and devices with mounting or support means.

312, Supports: Cabinet Structure, appropriate subclasses for supports or cabinet with nonreceptacle feature (e.g., door, shelf, or partition); subclass 7.1 for enclosures or cabinets without radio and television devices, per se; and subclass 20 for picture machine or film type device supports. Radio and television mount including electrical structure are classified in Classes 455 and 358, respectively.

313, Electric Lamp and Discharge Devices, subclasses 364+ for support equipment and housings with CRTs having structural or functional CRT detail.

314, Electric Lamp and Discharge Devices: Consumable Electrodes, subclasses 130+ for electric lamp and discharge devices (consumable electrodes) frames and electrode supports.

318, Electricity: Motive Power Systems, subclass 17 for portable-mounted motor and/or portable-mounted electrical motive power systems.

322, Electricity: Single Generator Systems, subclass 1 for a portable mounted single generator system.

331, Oscillators, subclasses 68+ for oscillators with outer casing or housing.

334, Tuners, subclass 85 for tuners with shielding or housing means.

336, Inductor Devices, subclasses 65+ for inductor devices with mounting or supporting means, subclasses 90+ for inductors with outer casing or housing, subclass 195 for coil supported within grooved or hollow coil conductor of another coil, and subclasses 199+ for coil or coil turn supports.

337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 34 for electrothermally actuated switches with space discharge having housings or support means and subclasses 112+ for electrothermally actuated switches housing or support means.

338, Electrical Resistors, subclasses 315+ for resistor with mounting or support means.

340, Communications: Electrical, subclass 391 for audible diaphragm with supports; subclasses 700+ for (a) support equipment and housings with selectable display units having structural display unit detail or (b) support equipment and housings with keyboards in conjunction with CRTs or selectable display units having structural detail of keyboard, CRT or display unit; subclass 814.14 for visual indicator (switchboard or panel type housings); and subclasses 815.15+ for visual indicator with lamp enclosed in housing.

341, Coded Data Generation or Conversion, subclasses 20+ for support equipment and housings with keyboards having a control element which an operator physically contacts to control the transmission or generation of a coded set of pulses.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), appropriate subclass for housing or support of directive radio wave system having directive radio wave structural details.

343, Communications: Radio Wave Antennas, subclass 702 for antenna with radio cabinet; subclasses 872+ for antenna with housing or protective covering; and subclasses 878+ for antenna with support for antenna, reflector or director.

346, Recorders, subclass 41 for recorder with case cover, case cover key, or keyhole cover; subclass 144 for watchman's or workman's key enclosing box; and subclass 145 for recorder with instrument support.

348, Television, subclasses 273+ for a television camera with housing or support and subclasses 787+, 789, and 836+ for a television projection or display device with cabinet or chassis structure. Television cabinet with no electrical limitation is classifierd in Class 312, subclass 7.2.

351, Optics: Eye Examining, Vision Testing and Correcting, appropriate subclass for rim mounts, semi-rim mounts, rimless mounting supports, and eye testing instrument supports.

352, Optics: Motion Pictures, subclasses 34+ for motion pictures (having sound accompaniment) with houses and supports, subclass 197 for camera and/or projector drive mechanisms with supporting structure, subclass 231 for motion picture gates with lens mounting, subclass 242 for motion picture with housing, and subclass 243 for motion picture with support.

353, Optics: Image Projectors, appropriate subclass for image projectors with case, cabinet, or housing.

355, Photocopying, subclasses 122+ for photocopying frames.

356, Optics: Measuring and Testing, subclasses 244+ for optical measuring and testing holder or support.

359, Optics: Systems (Including Communication) and Elements, appropriate subclass for optic system or element having supporting, mounting, or enclosing. House or support for diverse electrical components and optical components will be classified in Class 359, appropriate subclass.

360, Dynamic Magnetic Information Storage or Retrieval, subclass 86 for support equipment and housing of disk record having record transport with head moving during transducing and structural details of disk record, subclasses 97.01+ for support equipment and housing of disk record having record transport with head stationary during transducing and structural details of disk record, subclasses 104+ for recorder head mounting, and subclass 129 for recorder head accessory housing.

362, Illumination, appropriate subclass for light source with support, holder, casing, or housing.

363, Electric Power Conversion Systems, subclasses 144+ for current conversion system with conductive support mounting and subclass 146 for current conversion system encased in lug housing.

365, Static Information Storage and Retrieval, appropriate subclass for support equipment and houses with static memory having structural details of memory.

367, Communications, Electrical: Acoustic Wave Systems and Devices, subclass 173 for underwater signal transducer with support and subclass 188 for signal transducer receiver with casing or housing.

368, Horology: Time Measuring Systems or Devices, subclass 88 for chronological device with casing or mount and subclasses 276+ for time measuring device with cases.

369, Dynamic information Storage or Retrieval, subclass 6 for storage or retrieval device having structural details combined with radio, including cabinet details, and subclasses 75.1+ for storage or retrieval device having storage or retrieval structural details with particular cabinet structure.

372, Coherent Light Generators, subclass 107 for resonant cavity with mirror support.

373, Industrial Electric Heating Furnaces, subclasses 128+ for resistance furnace device with mount.

374, Thermal Measuring and Testing, subclasses 208+ for thermal measuring and testing device with housing or support.

378, X-Ray or Gamma Ray Systems or Devices, subclasses 193+ for X-ray or gamma ray with source supports.

379, Telephonic Communications, subclasses 325+ for telephonic centralized switching system with housing, subclasses 428+ for telephone terminal with housing and subclasses 454+ for telephone terminal with accessory or auxiliary equipment with support or stand.

380, Cryptography, subclasses 52+ for electrical signal modification device with support or housing.

381, Electrical Audio Signal Processing Systems and Devices, subclasses 322+ for electrical hearing aids with casing or housing, subclasses 361+ for microphone with mounting or support feature, subclasses 386+ for electro-acoustic audio transducer with mount or support feature, and subclasses 386+ for electro-acoustic transducer with mount.

396, Photography, appropriate subclasses for photographic support, mount, rest, or housing.

439, Electrical Connectors, subclass 2 for interrelated connectors relatively movable during use having antivibration mounting and subclasses 278+ for connector having resilient housing. Connector in conjunction with diverse electrical components are classified in Class 361. See Class 439 Definition, section VI. Index and Miscellaneous Class Notes for line between Class 174 and Class 439.

455, Telecommunications, subclass 90 for transceiver with enclosure or support means, subclass 128 for transmitter with casing or housing and subclasses 347+ for receiver or frequency converter with cabinet, housing, or chassis structure.

700, Data Processing: Generic Control Systems or Specific Applications, appropriate subclasses.

701, Data Processing: Vehicles, Navigation, and Relative Location, appropriate subclasses.

702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclasses.

703, Data Processing: Structural Design, Modeling, Simulation, and Emulation, appropriate subclasses.

704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/ Decompression, appropriate subclasses.

705, Data Processing: Financial, Business Practice, Management, or Cost/Price Determination, appropriate subclasses.

706, Data Processing: Artificial Intelligence, appropriate subclasses.

707, Data Processing: Database and File Management, Data Structures, or Document Processing, appropriate subclasses.

708, Electrical Computers: Arithmetic Processing and Calculating, appropriate subclasses.

709, Electrical Computers and Digital Processing Systems: Multiple Computer or Process Coordinating, appropriate subclasses.

710, Electrical Computers and Digital Data Processing Systems: Input/Output, appropriate subclasses.

711, Electrical Computers and Digital Processing Systems: Memory, appropriate subclasses.

712, Electrical Computers and Digital Processing Systems: Processing Architectures and Instruction Processing (e.g., Processors), appropriate subclasses.

713, Electrical Computers and Digital Processing Systems: Support, appropriate subclasses.

714, Error Detection/Correction and Fault Detection/Recovery, appropriate subclasses.

716, Data Processing: Design and Analysis of Circuit or Semiconductor Mask, appropriate subclasses.

717, Data Processing: Software Development, Installation, and Management, appropriate subclasses.

601 For electrical power distribution systems and devices:

This subclass is indented under subclass 600. Subject matter comprising a structural mounting arrangement for electrical components that divide and deliver electric energy among several electrical devices.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, appropriate subclasses for high tension conductor and insulator arrangements.

307, Electrical Transmission or Interconnection Systems, appropriate subclass for electrical interconnection systems.

602 Distribution station (i.e., substation):

This subclass is indented under subclass 601. Subject matter comprising a building or an outdoor location having plural distribution units that transform, convert, or control electric energy in a power system.

(1) Note. Outdoor stations may be above or below ground level.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for high tension conductor and insulator arrangements.

603 Having transformer:
This subclass is indented under subclass 602. Subject matter wherein the distribution station (substation) includes an electrical device which changes voltage in direct proportion to the number of turns of its primary and secondary windings.

SEE OR SEARCH THIS CLASS, SUBCLASS:
620, for electrical switchgear housings or mounting assembly with transformer.
623, for electrical power distribution systems housings and mounting assemblies with distribution or control unit combined with a transformer.
663, for electrical service meter housing or mounting assembly with transformer.
836, for electrical housing and mounting assembly with transformer.

604 Gas insulated:
This subclass is indented under subclass 602. Subject matter wherein the distribution units are separated from conducting bodies by means of a fluid that has neither independent shape nor volume, but tends to expand indefinitely.

SEE OR SEARCH THIS CLASS, SUBCLASS:
612, for electrical power switchgear housings and mounting assemblies with gas insulated busbar arrangements.

605 Electrical switchgear:
This subclass is indented under subclass 601. Subject matter comprising an aggregate of switching facilities for a power station or transforming station.

SEE OR SEARCH THIS CLASS, SUBCLASS:
828, for switch or switchboard associated with wire distribution means.
832, for switch or switchboard associated with frame.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, appropriate subclass for circuit breaker structure, per se.
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, appropriate subclass for electromagnetic circuit breakers.
337, Electricity: Electrothermally or Thermally Actuated Switches, appropriate subclass for thermally actuated circuit breakers.

606 Truck type:
This subclass is indented under subclass 605. Subject matter wherein the switchgear comprises heavy duty draw-out apparatus carried by a carriage with wheels.

607 With interlock:
This subclass is indented under subclass 606. Subject matter wherein a mechanism is provided for (a) governing or controlling an operation of a switch or (b) controlling insertion or withdrawal of a draw-out carriage.

SEE OR SEARCH THIS CLASS, SUBCLASS:
609, for interlock means in drawer-type switchgear.
615, for interlock in electrical switchgear, per se.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclasses 50.01+ for interlocking, per se.

608 Drawer type:
This subclass is indented under subclass 605. Subject matter wherein the switchgear comprises components on a sliding box or receptacle that is opened by pulling out and closed by pushing in, combined with an enclosure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
725, for cabinet-type housings with removable chassis.
730, for modules in a housing.

609 With interlock:
This subclass is indented under subclass 608. Subject matter wherein a mechanism is provided for (a) governing or controlling an operation of switch or (b) controlling insertion or withdrawal of the drawer.

SEE OR SEARCH THIS CLASS, SUBCLASS:
607, for interlock means in truck-type switchgear.
615, for interlock in electrical switchgear, per se.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclasses 50.17+ for draw-out type switchgear with an interlock means between the cover and the switch.

610 Pivoted support means:
This subclass is indented under subclass 605. Subject matter wherein the switchgear components are located on support or holding means that contain a shaft or pin which allows switchgear components to turn.

SEE OR SEARCH CLASS:
439, Electrical Connectors, subclass 261 for connector having coupling part with actuating means urging contact to move laterally with respect to rest of coupling part and toward mating port combined with pivotable means.

611 Busbar arrangements:
This subclass is indented under subclass 605. Subject matter wherein heavy copper straps or bars are used (a) to carry high currents or (b) to make a common connection between several circuits having specific structural order or relationship.

SEE OR SEARCH THIS CLASS, SUBCLASS:
624, for distribution or control unit housing or mounting assembly with busbars.
637, for busbar arrangements on panel boards.
648, for busbar arrangements on panel boards in distribution boxes.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for busbar arrangements, per se.

612 Gas insulated:
This subclass is indented under subclass 611. Subject matter wherein a composition primarily adapted for preventing the flow of electricity through busbars is a fluid that has neither independent shape nor volume, but tends to expand indefinitely.

613 Liquid insulated:
This subclass is indented under subclass 611. Subject matter wherein a composition primarily adapted for preventing a transfer of electricity through busbars is a fluid characterized by free movement of the constituent molecules among themselves, but without the tendency to separate.

614 With plural removable control units in housing:
This subclass is indented under subclass 611. Subject matter wherein the busbars are located in an enclosure which contains several separable units that divide and deliver electric energy among other electrical devices.

SEE OR SEARCH THIS CLASS, SUBCLASS:
648, for busbar arrangements on panel boards in distribution boxes.

SEE OR SEARCH CLASS:
312, Supports: Cabinet Structure, appropriate subclass for cabinet housings, per se.

615 With interlock:
This subclass is indented under subclass 605. Subject matter wherein the switchgear contains means for either preventing operation of a switch or for preventing movement of particular switch elements on their associated supports.

(1) Note. As an example, the switch operating handle might be latched in the off position until the switch unit is fully inserted on its housing.

SEE OR SEARCH THIS CLASS, SUBCLASS:
607, for interlock means in truck-type switchgear.
609, for interlock means in drawer-type switchgear.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclasses 42.01+ and 43.01+ for switches with unauthorized use prevention means and subclasses 50.17+ for switchgear with switch interlock mechanisms.

616 Door or cover type:
This subclass is indented under subclass 615. Subject matter wherein the interlock means is actuated or controlled by a swinging or sliding barrier of the switchgear.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclasses 50.17+ for draw-out switchgear with cover and switch interlock means.

617 Shutter type:
This subclass is indented under subclass 615. Subject matter wherein the interlock means is in the form of a sliding guard or shutter which physically closes off connecting apertures to the switchgear contacts.

SEE OR SEARCH THIS CLASS, SUBCLASS:
607, for draw-out type interlocks which comprise shutters.

618 Gas insulated:
This subclass is indented under subclass 605. Subject matter wherein an electrical switchgear material that prevents possible future contact of adjacent conductors resulting in a short circuit is a fluid having neither independent shape nor volume but tending to expand indefinitely.

SEE OR SEARCH THIS CLASS, SUBCLASS:
604, for distribution station housing or mounting assemblies with gas insulated switches.
619, for electrical switchgear housing or mounting assembly with gas insulated circuit breaker.

619 Having gas circuit breaker:
This subclass is indented under subclass 605. Subject matter wherein the electrical switchgear comprises circuit interrupting devices having surfaces separated by a fluid having neither independent shape nor volume, but tending to spread out and occupy the entire enclosure in which it is placed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
618, for electrical switchgear housing or mounting assembly with gas insulated switchgear.

620 Having transformer:
This subclass is indented under subclass 605. Subject matter wherein the electrical switchgear is combined with an electrical device which changes voltage in direct proportion to the ratio of the number of turns of its primary and secondary windings.

SEE OR SEARCH THIS CLASS, SUBCLASS:
603, for electrical power distribution station housings having a transformer.
623, for distribution or control unit housings or mounting assemblies with transformer.
663, for electrical service meter housing or mounting assembly with transformer.
836, for electrical housing or mounting assembly with transformer.

SEE OR SEARCH CLASS:
336, Inductor Devices, appropriate subclass for transformer, per se.

621 Having isolating switch:
This subclass is indented under subclass 605. Subject matter wherein the electrical switchgear comprises a device intended to separate an electric circuit from the power source with no interrupting rating and intended to be operated only after the circuit has been opened by some other means.

622 Distribution or control unit:
This subclass is indented under subclass 601. Subject matter wherein components that divide and deliver electric energy among several electrical devices are mounted on or in a support unit with an enclosure.

623 Having transformer:
This subclass is indented under subclass 622. Subject matter wherein the distribution or control unit is combined with an electrical device which changes voltage in direct proportion to the ratio of the number of turns of its primary and secondary windings.

SEE OR SEARCH THIS CLASS, SUBCLASS:
603, for electrical power distribution station housing with transformer.
620, for electrical switchgear housings or mounting assembly with transformer.
663, for electrical service meter housing or mounting assembly with transformer.
836, for electrical housing or mounting assembly with transformer.

SEE OR SEARCH CLASS:
336, Inductor Devices, appropriate subclass for transformer.

624 Having busbar arrangement:
This subclass is indented under subclass 622. Subject matter wherein the distribution or control unit contains heavy copper straps or bars used (a) to carry high currents or (b) to make a common connection between several circuits with specific relationship or order.

SEE OR SEARCH THIS CLASS, SUBCLASS:
611, for electrical switchgear housings or mounting assemblies with busbar arrangements.
637, for busbar arrangements on panel boards.
648, for busbar arrangements on panel boards in distribution boxes.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for busbar arrangements, per se.

625 Portable:
This subclass is indented under subclass 622. Subject matter wherein the distribution or control unit is capable of being easily carried or moved about.

626 Having fuse or relay:
This subclass is indented under subclass 622. Subject matter wherein the distribution or control unit contains a protective device, usually a short piece of wire, but sometimes a chemical compound, that melts and breaks the circuit when a current exceeds a rated value or an electromechanical device in which contacts are opened and/or closed by a variation in condition of one electric circuit and thereby affect an operation of other devices in same or other electric circuits.

627 Distribution or control panel board:
This subclass is indented under subclass 601. Subject matter comprising a mounting plate of metal or insulation for mounting electrical power distribution or control devices and having no enclosure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
644+, for panel boards which are mounted in an electrical service or distribution box.
748+, for printed circuits with diverse components.

628 With switches and fuses:
This subclass is indented under subclass 627. Subject matter wherein the panel mounted distribution or control board comprises (a) mechanical or electrical devices that complete or break the path of current or send a current over a different path and (b) protective devices, usually short pieces of wire but sometimes chemical compounds, that melt and break a circuit when a current exceeds a rated value.

SEE OR SEARCH THIS CLASS, SUBCLASS:
646, for panel mounted fuses and/or manually operated switches which are mounted in an electrical service or distribution box.
828, for a switch associated with a wire distribution means.

832, for a switch associated with a frame.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclasses 237+ for switch structure, per se.
337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 4 for fuse structure, per se, and subclasses 8+ for a fusible element with a manually operated switching device.

629 Unit block:
This subclass is indented under subclass 628. Subject matter wherein the fuses or switches are packaged in separate support sets and the dimension for each support set is the same.

SEE OR SEARCH THIS CLASS, SUBCLASS:
646, for a panel mounted fuse support means that is mounted in an electrical service or distribution box.
647, for a panel mounted switch support means that is mounted in an electrical service or distribution box.
833+, for fuse blocks of unit construction.

630 With fuses:
This subclass is indented under subclass 627. Subject matter wherein the panel mounted distribution or control board comprises protective devices, usually short pieces of wire but sometimes chemical compounds, that melt and break a circuit when a current exceeds a rated value.

SEE OR SEARCH THIS CLASS, SUBCLASS:
628+, for panel mounted switches and fuses.
646, for panel mounted fuse support means mounted in an electrical service or distribution box.
833+, for fuse blocks of unit construction.

SEE OR SEARCH CLASS:
337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 4 for fuse structure, per se.

631 With switches:
This subclass is indented under subclass 627. Subject matter wherein the panel mounted distribution or control board comprises manually operated mechanical or electrical devices that complete or break a path of current or send it over a different path.

SEE OR SEARCH THIS CLASS, SUBCLASS:
628+, for panel mounted switches and fuses.
647, for panel mounted fuse switch support means mounted in an electrical service or distribution box.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclasses 237+ for electric switch structure details, per se.

632 With switch actuating arrangements:
This subclass is indented under subclass 631. Subject matter wherein a toggle or spring is provided to move the switch.

633 Plugboards:
This subclass is indented under subclass 627. Subject matter wherein the panel board is provided with a plurality of conductors or busbars that are connected together by use of removable plug-like members.

SEE OR SEARCH THIS CLASS, SUBCLASS:
652, for circuit breaker arrangements housed in an electrical distribution box.
673, for circuit breaker supports, per se.

SEE OR SEARCH CLASS:
379, Telephonic Communications, subclass 332 for telephone centralized switching system including plug and socket.
439, Electrical Connectors, subclasses 43+ for plugboard structure, per se.

634 With circuit breaker arrangements:
This subclass is indented under subclass 627. Subject matter comprising a sequence or relationship of electromechanical circuit interrupting devices having separable contacts on the panel board.

SEE OR SEARCH THIS CLASS, SUBCLASS:
652+, for circuit breaker arrangement in a service distribution box.

673, for circuit breaker supports, per se.

635 With discriminating means:
This subclass is indented under subclass 634. Subject matter wherein the circuit breaker arrangement comprises structure which prevents free-interchange ability of different size circuit breakers.

(1) Note. This is commonly done by circuit breaker projections which can be inserted only into selected board apertures.

636 Plug-in or removable:
This subclass is indented under subclass 634. Subject matter wherein the circuit breakers can be easily installed or removed from support equipment.

(1) Note. Plug-in connections can be completed through pins, plugs, jacks, sockets, receptacles, or other ready connectors.

SEE OR SEARCH THIS CLASS, SUBCLASS:
640, for distribution or control panel board with busbar or conductor arrangements and having removable or plug-in connector.
656, for electric service distribution box including panel board with plug-in circuit breakers.

637 Busbar or conductor arrangements:
This subclass is indented under subclass 627. Subject matter wherein the distribution or control panel board comprises specific support structure for heavy copper straps or bars used (a) to carry high currents or (b) to make common connections between several circuits.

SEE OR SEARCH THIS CLASS, SUBCLASS:
611, for busbar arrangements in electrical switchgear.
624, for distribution or control unit housing or mounting assembly with busbar arrangement.
648, for busbar arrangement in a distribution box.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for busbar supports, per se.

638 U-shaped member:
This subclass is indented under subclass 637. Subject matter wherein the busbar arrangement is (a) configured like a letter U or (b) connected to a member configured like a letter U or (c) supported by a member configured like a letter U.

SEE OR SEARCH THIS CLASS, SUBCLASS:
649, for electric service distribution panel board with busbar arrangement and having a U-shaped member.

639 With horizontal busbar:
This subclass is indented under subclass 637. Subject matter wherein a heavy copper strap or bar used to carry high currents is parallel to the panel board base structure.

640 With removable or plug-in connection:
This subclass is indented under subclass 637. Subject matter wherein electrical devices can be easily installed or removed from support equipment.

(1) Note. Plug-in connections can be completed through pins, plugs, jacks, sockets, receptacles, or other ready connectors.

SEE OR SEARCH THIS CLASS, SUBCLASS:
636, for distribution or control panel board with circuit breaker arrangements and having plug-in or removable circuit breakers.
656, for electric service distribution box including panel board with plug-in circuit-breakers.

641 Electric service distribution box:
This subclass is indented under subclass 601. Subject matter comprising a housing for low voltage switching and power regulation.

(1) Note. The housing is usually a rectangular box with a hinged door adapted to be mounted on or in a wall.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 52.1+ for housing with electric apparatus having no specific art limitations.
220, Receptacles, appropriate subclass for metal containers, per se.

642 With fuse:
This subclass is indented under subclass 641. Subject matter wherein the electric service distribution box contains a protective device, usually a short piece of wire but sometimes a chemical compound, which melts and breaks a circuit when a current exceeds a rated value.

643 With switch:
This subclass is indented under subclass 641. Subject matter wherein the housing contains a mechanical or electrical device that completes or breaks the path of current or sends the current over a different path.

644 Including panel board:
This subclass is indented under subclass 641. Subject matter wherein the housing includes a mounted plate of metal or insulation for a control of other parts of electrical equipment.

SEE OR SEARCH THIS CLASS, SUBCLASS:
627+, for distribution or control panel boards.

645 Adjustable panel:
This subclass is indented under subclass 644. Subject matter wherein means are provided to modify a position of the panel within the housing.

646 With fuse support means:
This subclass is indented under subclass 644. Subject matter wherein the panel board has structure capable of supporting a protective device, usually a short piece of wire but sometimes a chemical compound, which melts and breaks a circuit when a current exceeds a rated value.

SEE OR SEARCH THIS CLASS, SUBCLASS:
630, for panel mounted fuses, per se.
642, for electric service distribution boxes with a fuse.

647 With switch support means:
This subclass is indented under subclass 644. Subject matter wherein the panel board has structure capable of supporting a mechanical or electrical device that completes or breaks a path of current or sends it over a different path.

SEE OR SEARCH THIS CLASS, SUBCLASS:
631, for panel mounted switches, per se.
643, for electric service distribution boxes with switch.

648 Busbar arrangements:
This subclass is indented under subclass 644. Subject matter wherein the panel supports specific structure for a heavy copper strap or bar used (a) to carry high currents or (b) to make a common connection between several circuits.

SEE OR SEARCH THIS CLASS, SUBCLASS:
611, for busbar arrangements in electrical switchgear.
624, for enclosed distribution or control unit housing or mounting assembly with busbars.
637, for panel boards with no enclosure containing busbars.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for busbar supporting arrangements, per se.

649 U-shaped member:
This subclass is indented under subclass 648. Subject matter wherein the busbar is (a) configured like a letter U or (b) connected to a member configured like a letter U or (c) supported by a member configured like a letter U.

SEE OR SEARCH THIS CLASS, SUBCLASS:
638, for distribution or control panel board with busbar or conductor arrange-

ments and having a U-shaped member.

650 Spaced parallel relationship:
This subclass is indented under subclass 648. Subject matter wherein the busbars are arranged extending, in the same direction, everywhere equidistant and having space separating the busbars.

651 Panel board corner mountings:
This subclass is indented under subclass 644. Subject matter wherein an electrical device is mounted adjacent to intersecting edges or sides of a panel board within the housing.

652 Circuit breaker supporting arrangements:
This subclass is indented under subclass 644. Subject matter comprising particular mounting for circuit interrupting devices on the electric service distribution panel board.

SEE OR SEARCH THIS CLASS, SUBCLASS:
634, for circuit breakers supported on distribution or control panel board.

653 With discriminating means:
This subclass is indented under subclass 652. Subject matter wherein the circuit breaker arrangement comprises structure which prevents free-interchange ability of different size circuit breakers.

(1) Note. This is commonly done by circuit breaker projections which can be inserted only into selected board apertures.

SEE OR SEARCH THIS CLASS, SUBCLASS:
635, for circuit breaker arrangements supported on distribution or control panel boards having discriminating means.

654 With tamper prevention means:
This subclass is indented under subclass 652. Subject matter wherein a particular support or mechanism is provided to prevent unauthorized access to the circuit breakers.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclass 110 for circuitry that combats attempts to cause a meter to read inaccurately.

655 Having two row arrangement:
This subclass is indented under subclass 652. Subject matter wherein the circuit breakers are arranged in two lines or rows.

656 With plug-in circuit breakers:
This subclass is indented under subclass 652. Subject matter wherein the circuit breakers can be easily installed or removed from support equipment.

(1) Note. Plug-in connections can be completed through pins, plugs, jacks, sockets, receptacles, or other ready connectors.

SEE OR SEARCH THIS CLASS, SUBCLASS:
636, for distribution or control panel board with circuit breaker arrangements and having plug-in or removable circuit breakers.
640, for distribution or control panel board with busbar arrangement and having plug-in connector.

657 With removable member:
This subclass is indented under subclass 641. Subject matter wherein the electric service distribution box contains a support part that can be taken away or off.

658 With plastic enclosure or support:
This subclass is indented under subclass 641. Subject matter wherein the electric service distribution box includes a surrounding or support part whose substance is any of numerous organic synthetic or processed materials that are mostly thermosetting polymers of high molecular weight and that can be molded, cast, extruded, drawn, or laminated into objects, films, or filaments.

659 For electricity service meter:
This subclass is indented under subclass 601. Subject matter comprising boxes, housings or miscellaneous structures specifically for

mounting or housing an electric measuring apparatus.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclasses 74+ for electric meters having significant electric meter structure. Note, particularly subclass 110 for electric meters having protective and fraud combating means, other than casings and housing; subclass 149 for electric meters having probes, prods, or terminals; and subclass 156 for electric meter with measuring structure having casing.

660 Plural:
This subclass is indented under subclass 659. Subject matter comprising two or more meters.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclass 114 for plural electric meters having significant measuring structure.

661 With meter circuit controller:
This subclass is indented under subclass 659. Subject matter comprising means for regulating a current through a meter circuit.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, appropriate subclasses for switches, per se.
324, Electricity: Measuring and Testing, subclasses 115+ for electric meters having plural ranges, scales, or registration rates, such as multirange instruments, and subclass 149 for electric meter having probes, prods, or terminals.
439, Electrical Connectors, appropriate subclasses for electrical connectors, per se.

662 Bypass arrangement:
This subclass is indented under subclass 661. Subject matter comprising means to close a conducting path when the meter is in a disconnected condition.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, subclasses 51+ for circuit makers and breakers combined with or actuated by connector coupling.

663 With transformer or circuit breaker:
This subclass is indented under subclass 661. Subject matter wherein the meter circuit controller comprises (a) an electrical device which changes voltage in direct proportion to a number of turns of its primary and secondary windings or (b) a device for interrupting a circuit under normal or abnormal conditions by means of separable contacts.

SEE OR SEARCH THIS CLASS, SUBCLASS:
603, for electrical power distribution station housing having a transformer.
620, for electrical switchgear housing or mounting assembly with a transformer.
623, for distribution or control unit housings or mounting assemblies with a transformer.
863, for electrical housing or mounting assembly with a transformer.

SEE OR SEARCH CLASS:
336, Inductor Devices, appropriate subclass for transformer, per se.

664 Meter mounting arrangements:
This subclass is indented under subclass 659. Subject matter wherein specific structure is provided to mount or support the electricity service meter (a) to another structure or (b) within a housing.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclass 149 for electric meters having probes, prods, or terminals and subclass 156 for electric meter having casings.

665 Adaptable meter supports:
This subclass is indented under subclass 664. Subject matter wherein the meter support structure is adjustable or adaptable to support meters of different sizes on or in a same support.

666 Retractable or detachable meter support:
This subclass is indented under subclass 664. Subject matter wherein (a) the meter support structure supports the meter in a position other than in its normally located position or (b) the meter support structure has separable or detachable parts.

(1) Note. This subject matter includes, for example, pivoting means to move the meter to more than one position.

667 Removable cover:
This subclass is indented under subclass 664. Subject matter wherein a cover, top, or lid of the meter can be easily taken away or off.

668 Meter terminal and connector arrangements:
This subclass is indented under subclass 659. Subject matter wherein an electrical interconnecting structure external to the meter has a particular order or relationship.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclass 149 for electric meters having terminals, prods, or connectors.
439, Electrical Connectors, appropriate subclasses for electrical connectors having housing or terminal enclosures.

669 Terminal block:
This subclass is indented under subclass 668. Subject matter comprising an insulating base or slab equipped with one or more electrical connection points for the purpose of making electrical connections thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:
822, for terminal blocks with plural components.

SEE OR SEARCH CLASS:
439, Electrical Connectors, subclasses 884+ for terminal blocks, per se.

670 Contact blade receiving structure:
This subclass is indented under subclass 668. Subject matter comprising a female receptacle support for male meter blades.

SEE OR SEARCH CLASS:
439, Electrical Connectors, appropriate subclass for blade receiving structure, per se.

671 Adjustable or adaptable contacts:
This subclass is indented under subclass 668. Subject matter wherein means are provided to (a) mount contacts or electrical junction points in a plurality of positions or (b) mount a plurality of separate discrete contacts or electrical junction points.

(1) Note. The contacts included are both the meter blade contacts and the female receptacle contacts.

672 Tamper resistant:
This subclass is indented under subclass 659. Subject matter comprising a housing or support that prevents unauthorized access to the meter or a terminal.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclass 110 for electrical circuitry that combats attempts to cause the meter to read inaccurately.

673 Circuit breaker supporting means (i.e., attaching, mounting, etc.):
This subclass is indented under subclass 601. Subject matter comprising structural means for attaching a circuit interrupting device having separable contacts to a support or mount.

SEE OR SEARCH THIS CLASS, SUBCLASS:
634, for circuit breakers on panel boards.
652, for circuit breakers on panel boards within a service distribution box.

SEE OR SEARCH CLASS:
248, Supports, appropriate subclass for supports, per se.

674 For ballast elements:
This subclass is indented under subclass 601. Subject matter comprising a housing specifically for electrical diverse devices that provide a starting voltage or stabilizing current in a circuit with electronic-discharge lamps.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 52.1+ for housings having electrical devices including ballast component or plural same ballast component.

315, Electric Lamp and Discharge Devices: Systems, subclasses 56 through 63 for electric discharge type devices.

336, Inductor Devices, subclass 96 for potted inductor devices and search subclasses 105 and 107 for inductor devices combined with a connector.

362, Illumination, appropriate subclass for illumination type signal devices.

675 Bus duct:

This subclass is indented under subclass 601. Subject matter comprising a protective tube or pipe used for supporting busbar structure.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, appropriate subclass for bus duct structure, per se.

676 With cooling means:

This subclass is indented under subclass 601. Subject matter comprising means for dissipating heat produced by the power distribution systems or devices.

SEE OR SEARCH THIS CLASS, SUBCLASS:

687, for computer support equipment with cooling means.

688+, for cooling means with electronic apparatus.

SEE OR SEARCH CLASS:

165, Heat Exchange, appropriate subclass for cooling means, per se.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 712+ for solid-state devices having solid-state device structural details combined with cooling means.

677 Fluid:

This subclass is indented under subclass 676. Subject matter wherein the cooling means is provided by a substance tending to flow or conform to an outline of its container.

SEE OR SEARCH THIS CLASS, SUBCLASS:

689+, for fluid cooling means in electronic apparatus.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, appropriate subclass for the fluid cooling of conductors.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 712+ for solid-state devices having solid-state structural details combined with cooling means.

678 Air:

This subclass is indented under subclass 677. Subject matter wherein a mixture of an invisible, odorless, and tasteless gas (as nitrogen and oxygen that surrounds the earth) is the fluid cooling means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

690+, for air cooling means in electronic apparatus.

704+, for thermal conductor which dissipates heat into the air.

679 For electronic systems and devices:

This subclass is indented under subclass 600. Subject matter comprising housings or mounting assemblies specifically for electronic systems and devices not provided for elsewhere.

(1) Note. Support equipment and housings for disk drives, keyboards, display units and cathode-ray tubes (CRTs) without structural detail or particular equipment description for disk drive, keyboard, display unit, or CRT will be classified in this subclass.

SEE OR SEARCH CLASS:

200, Electricity: Circuit Makers and Breakers, subclasses 5+ for similar type switches arranged in a keyboard manner.

235, Registers, subclass 145 for keyboard support equipment and housings comprising those parts of registers, usually manually actuated (including keys, shift-keys, and space bars) which control and initiate the action of the calculating machine to determine what numbers shall be introduced and how; also to control subsidiary operation of the machine.

313, Electric Lamp and Discharge Devices, subclasses 364+ for CRT support equipment and housings having structural CRT detail.

340, Communications: Electrical, subclasses 700+ for (a) support equipment and housing with display units having structural display unit detail or (b) support equipment and housings with keyboards in conjunction with CRTs and selectable display units having structural detail of keyboard, CRT, or selectable display unit.

341, Coded Data Generation or Conversion, subclasses 20+ for keyboard support equipment and housings having a control element which an operator physically contacts to control the transmission or generation of a coded set of pulses and subclass 27 for keyboard support equipment and housings having structural keyboard detail and give an indication of key operation which may be heard or felt by the operator.

680 Including keyboard support:

This subclass is indented under subclass 679. Subject matter wherein (a) at least one electronic device is a portion of a terminal used to generate a character stream to a computer or other communication device combined with housing or mounting arrangement or (b) at least one electronic device has key input means combined with housing or mounting arrangement.

(1) Note. This subclass provides for only nominal recitation of a keyboard.

SEE OR SEARCH CLASS:

178, Telegraphy, subclass 17 for automatic transmitter or recorder with keyboard.

200, Electricity: Circuit Makers and Breakers, subclasses 5+ for similar type switches arranged in keyboard manner.

235, Registers, subclasses 145+ for keyboards comprising those parts of registers, usually manually actuated, including key, shift-keys, space bars, etc., that control and initiate the action of the calculating machine to determine what numbers shall be introduced and how; also to control subsidiary operation of the machine.

312, Supports: Cabinet Structure, appropriate subclass for keyboard supports or furniture without a keyboard.

340, Communications: Electrical, subclasses 706+ for keyboard in conjunction with CRTs or selectable display units having structural details of a keyboard, CRT, or selectable display unit.

341, Coded Data Generation or Conversion, subclasses 22+ for (a) keyboards having a control element which an operator physically contacts to control the transmission or generation of a coded set of pulses or (b) keyboards with structural detail and give an indication of key operation which may be heard or felt by an operator.

400, Typewriting Machines, subclasses 472+ for keyboard or key lever actuating mechanism.

681 This subclass is indented under subclass 679. Subject matter wherein at least one electronic device presents information in visual form combined with housing or mounting arrangement.

(1) Note. This subclass provides for only nominal recitation of a display.

SEE OR SEARCH CLASS:

40, Card, Picture, or Sign Exhibiting, appropriate subclass for display information by print or paint on boards, viewers, labels, or tags.

109, Safes, Bank Protection or a Related Device, subclasses 10+ for safety partitions and display partitions.

178, Telegraphy, subclass 15 for automatic photographic recorder.

217, Wooden Receptacles, appropriate subclass for boxes having compartments with displays.

248, Supports, subclasses 917+ for video display screen support.

273, Amusement Devices: Games, appropriate subclass for games with display.

296, Land Vehicles: Bodies and Tops, appropriate subclass for bodies with advertising and displaying.

312, Supports: Cabinet Structure, subclasses 114+ for showcase type supports.

313, Electric Lamp and Discharge Devices, appropriate subclasses for light sources, per se.

324, Electricity: Measuring and Testing, subclasses 74+ for digital meters.

340, Communications: Electrical, subclasses 700+ for support equipment and housing for display units having structural or functional display unit detail.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), appropriate subclass for radar display systems.

345, Computer Graphics Processing, Operator Interface Processing, and Selective Visual Display Systems, subclasses 467 through 472 for character font generation and subclasses 700-867 for operator interface processing.

346, Recorders, subclasses 17+ for recorder combined with nonrecording indicator.

348, Television, subclasses 825+ for functional detail of a cathode-ray tube combined with support equipment.

352, Optics: Motion Pictures, subclass 87 for photographic recording or animation.

358, Facsimile and Static Presentation Processing, subclasses 1.1 through 1.18 for static presentation processing (e.g., processing data for printer, etc.).

359, Optics: Systems (Including Communication) and Elements, subclasses 330+ for liquid crystal display support having optical liquid crystal details.

362, Illumination, subclasses 227+ for plural light sources in general lighting uses.

368, Horology: Time Measuring Systems or Devices, appropriate subclass for displays of time.

396, Photography, subclass 550 for photoelectronic type photocomposing systems.

400, Typewritng Machines, subclasses 83+ for displaying typewriter-formed representation of print-line.

434, Education and Demonstration, subclasses 365+ for displaying educational material.

463, Amusement Devices: Games, for game apparatus in which a display is included.

473, Games Using Tangible Projectile, for game apparatus used for a game which uses a tangible projectile and in which a display is included.

715, Data Processing: Presentation Processing of Document, appropriate subclasses for document processing performed by a computer for presentation.

682 CRT support:

This subclass is indented under subclass 681. Subject matter wherein at least one electronic device is a vacuum tube in which its electron beam can be focused to a small cross section on a luminescent screen and can be varied in position and intensity to produce a visible pattern combined with housing or mounting arrangement.

(1) Note. This subclass provides for only nominal recitation of a CRT.

SEE OR SEARCH CLASS:

204, Chemistry: Electrical and Wave Energy, subclasses 192.1+ for cathode-ray tube coating, forming, or etching by sputtering.

312, Supports: Cabinet Structure, appropriate subclass for cathode-ray tube furniture without cathode-ray tube.
313, Electric Lamp and Discharge Devices, subclasses 364+ for cathode-ray tube, per se.
315, Electric Lamp and Discharge Device: Systems, subclasses 1+ for cathode-ray tube circuits, per se.
324, Electricity: Measuring and Testing, subclasses 121+ for measuring, testing, or sensing using a cathode-ray tube.
340, Communications: Electrical, subclasses 720+ for cathode-ray tube display system having structural or functional details of display system.
347, Incremental Printing of Symbolic Information, subclasses 226+ for radiation marking using cathode-ray tube.
348, Television, subclasses 825+ for functional detail of a cathode-ray tube combined with support equipment.
358, Facsimile and Static Presentation Processing, subclass 485 for facsimile having cathode-ray tube scanning.
386, Television Signal Processing for Dynamic Recording or Reproducing, subclasses 42+ and 128+ for photographic television recording, particularly subclass 130 for cathode-ray tube.
430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclasses 23+ for process of producing cathode-ray tube.
434, Education and Demonstration, subclass 307 for cathode ray screen display and audio means in education and subclass 323 for cathode ray screen display included in examining means of question or problem eliciting response.
445, Electric Lamp or Space Discharge Component or Device Manufacturing, subclasses 36+ for manufacturing process of cathode-ray tube.

683 Computer related support:

This subclass is indented under subclass 679. Subject matter wherein (a) at least one electronic device is a data processor or calculator combined with housing or mounting arrangement or (b) at least one electronic device is a component of a data processor or calculator combined with housing or mounting arrangement.

(1) Note. This subclass provides for only nominal recitation of computer or computer component.

SEE OR SEARCH CLASS:

312, Supports: Cabinet Structure, appropriate subclass for computer furniture without a computer or computer component.
700, Data Processing: Generic Control Systems or Specific Applications, appropriate subclasses.
701, Data Processing: Vehicles, Navigation, and Relative Location, appropriate subclasses.
702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclasses.
703, Data Processing: Structural Design, Modeling, Simulation, and Emulation, appropriate subclasses.
704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/Decompression, appropriate subclasses.
705, Data Processing: Financial, Business Practice, Management, or Cost/Price Determination, appropriate subclasses.
706, Data Processing: Artificial Intelligence, appropriate subclasses.
707, Data Processing: Database and File Management, Data Structures, or Document Processing, appropriate subclasses.
708, Electrical Computers: Arithmetic Processing and Calculating, appropriate subclasses.
709, Electrical Computers and Digital Processing Systems: Multiple Computer or Process Coordinating, appropriate subclasses.
710, Electrical Computers and Digital Data Processing Systems: Input/Output, appropriate subclasses.
711, Electrical Computers and Digital Processing Systems: Memory, appropriate subclasses.

712, Electrical Computers and Digital Processing Systems: Processing Architectures and Instruction Processing (e.g., Processors), appropriate subclasses.

713, Electrical Computers and Digital Processing Systems: Support, appropriate subclasses.

714, Error Detection/Correction and Fault Detection/Recovery, appropriate subclasses.

716, Data Processing: Design and Analysis of Circuit or Semiconductor Mask, appropriate subclasses.

717, Data Processing: Software Development, Installation, and Management, appropriate subclasses.

684 Memory unit support:

This subclass is indented under subclass 683. Subject matter wherein at least one electronic device is a computer component that stores information combined with housing or mounting arrangement.

(1) Note. This subclass provides for only nominal recitation of memory unit.

SEE OR SEARCH CLASS:

345, Computer Graphics Processing, Operator Interface Processing and Selective Visual Display Systems, subclasses 418+ for computer graphics processing.

360, Dynamic Magnetic Information Storage or Retrieval, appropriate subclass for magnetic information storage, per se.

365, Static Information Storage and Retrieval, subclasses 1+ for magnetic bubbles, per se; subclasses 185.01+ for floating gate memory storage (e.g., flash memory); subclasses 45+ for analog storage systems, per se; subclasses 49+ for associative memories, per se; and subclasses 94+ for read only systems, per se.

368, Horology: Time Measuring Systems and Devices, subclass 111 for electrical time device with electronic memory storage.

369, Dynamic Information Storage or Retrieval, appropriate subclass for dynamic information storage, per se.

700, Data Processing: Generic Control Systems or Specific Applications, subclasses 245 through 264 for data processing of robot control systems.

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.

714, Error Detection/Correction and Fault Detection/Recovery, subclasses 718+ for diagnostic memory testing and subclasses 1+ for reliability and availability in a digital data processing system.

685 Disk drive support:

This subclass is indented under subclass 684. Subject matter wherein at least one electronic component is a device that rotates a storage medium, writes data onto it, and reads data from it as instructed by a program combined with housing or mounting arrangement.

(1) Note. This subclass provides for only nominal recitation of a disk drive unit.

SEE OR SEARCH CLASS:

360, Dynamic Magnetic Information Storage or Retrieval, subclasses 97.01+ for floppy disk player, per se.

369, Dynamic Information Storage or Retrieval, subclasses 100+ for optical or compact disk players, per se, and subclasses 275.1+ for optical or compact disks, per se.

686 Input/output device support:

This subclass is indented under subclass 683. Subject matter wherein at least one electronic component (a) provides a means of communication between the computer and other electrical equipment or (b) provides a means of communication between two or more computers, combined with housing or mounting arrangement.

(1) Note. This subclass provides for only nominal recitation of an input-output device.

SEE OR SEARCH CLASS:
700, Data Processing: Generic Control Systems or Specific Applications, subclasses 1 through 89 for data processing control systems, methods, or apparatus, per se.

687 With cooling means:
This subclass is indented under subclass 683. Subject matter wherein the computer related support equipment includes means for dissipating heat from computer components.

SEE OR SEARCH THIS CLASS, SUBCLASS:
274.1+, for protecting against or compensating for variations in internal temperatures of capacitors.
676, for cooling means in power distribution systems and devices.
688, for cooling means with electronic apparatus.

SEE OR SEARCH CLASS:
165, Heat Exchange, appropriate subclasses for heat exchange, per se.
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 712+ for solid-state devices with cooling means.

688 With cooling means:
This subclass is indented under subclass 679. Subject matter wherein the electronic system or device comprises means for dissipating heat from electronic components.

SEE OR SEARCH THIS CLASS, SUBCLASS:
274.1+, for protecting against or compensating for variations in internal temperatures of capacitors.
676, for cooling in power distribution systems and devices.
687, for computer support equipment with cooling means.

SEE OR SEARCH CLASS:
165, Heat Exchange, appropriate subclasses for heat exchange, per se.
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 712+ for solid-state devices having solid-state structural details combined with cooling means.

689 Fluid:
This subclass is indented under subclass 688. Subject matter wherein the cooling means is provided by a substance tending to flow or conform to an outline of its container.

SEE OR SEARCH THIS CLASS, SUBCLASS:
677, for fluid cooling in power distribution systems and devices.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 252 for the fluid cooling of conductors.
257, Active Solid-State Diodes (e.g., Transistors, Solid-State Diodes), subclasses 712+ for solid-state devices having solid-state structural details combined with fluid cooling means.

690 Air:
This subclass is indented under subclass 689. Subject matter wherein a mixture of invisible, odorless, and tasteless gas (as nitrogen and oxygen that surround the earth) is the fluid cooling means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
678, for air cooling means in power distribution systems and devices.
704, for thermal conductor which dissipates heat into the air.

691 Pressurized or conditioned:
This subclass is indented under subclass 690. Subject matter wherein the air has (a) an applied force other than natural forces or (b) humidity and temperature control.

SEE OR SEARCH CLASS:
62, Refrigeration, subclasses 56+ for refrigeration processes, per se.

692 Plural openings:
This subclass is indented under subclass 690. Subject matter wherein the cooling means has two or more vents that allow air circulation.

SEE OR SEARCH CLASS:
454, Ventilation, appropriate subclass for ventilation, per se.

693 Circular:
This subclass is indented under subclass 692. Subject matter wherein the plural openings for air intake or exhaust are structured in small circular shapes.

694 With air circulating means:
This subclass is indented under subclass 690. Subject matter wherein the cooling means comprises specific means for air movement.

695 Fan or blower:
This subclass is indented under subclass 694. Subject matter wherein the cooling means comprises a device that consists of a series of vanes radiating from a hub rotated on its axle by a motor.

696 With heat exchanger unit:
This subclass is indented under subclass 695. Subject matter wherein the cooling means comprises a device that transfers warmth from one fluid to another without allowing them to mix.

SEE OR SEARCH THIS CLASS, SUBCLASS:
701, for liquid cooling system with heat exchanger unit.

SEE OR SEARCH CLASS:
165, Heat Exchange, appropriate subclasses for heat exchange, per se.

697 With heat sink or cooling fins:
This subclass is indented under subclass 695. Subject matter wherein the cooling means comprises (a) a mass of metal added to a device for an absorption or transfer of heat from critical electrical parts or (b) a metal disk or a thin projecting metal strip attached to a semiconductor to dissipate heat.

698 And liquid:
This subclass is indented under subclass 690. Subject matter wherein the fluid comprises (a) the air and (b) a substance characterized by free movement of constituent molecules among themselves but without tendency to separate.

699 Liquid:
This subclass is indented under subclass 698. Subject matter wherein the fluid comprises a substance characterized by free movement of constituent molecules among themselves but without tendency to separate.

700 Change of physical state:
This subclass is indented under subclass 699. Subject matter wherein the liquid (a) changes to a gas (vapor) or (b) changes from a gas (vapor) to liquid.

701 With heat exchange unit:
This subclass is indented under subclass 689. Subject matter wherein the cooling means comprises a device that transfers warmth from one fluid to another without allowing them to mix.

SEE OR SEARCH THIS CLASS, SUBCLASS:
696, for air cooling system with fan or blower having a heat exchanger unit.

SEE OR SEARCH CLASS:
165, Heat Exchange, appropriate subclasses for heat exchange, per se.

702 With cold plate or heat sink:
This subclass is indented under subclass 689. Subject matter wherein the cooling means comprises the fluid and (a) a mass of metal that is added to a device for absorption or transfer of heat from critical electrical parts or (b) a plate or bar that transfers heat from critical electrical parts.

SEE OR SEARCH THIS CLASS, SUBCLASS:
709+, for thermal conduction through support means having heat sinks.
711, for thermal conduction through support means having a cooling plate or bar.

703 With cooling fins:
This subclass is indented under subclass 689. Subject matter wherein the cooling means comprises the fluid and a metal disk or a thin projecting metal strip attached to a semiconductor to dissipate heat.

704 Thermal conduction:
This subclass is indented under subclass 688. Subject matter wherein the electronic system or device is cooled by transmitting heat through a heat transmitting member.

SEE OR SEARCH THIS CLASS, SUBCLASS:
707, for thermal conduction through the component support means.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for heat conducting members (heat sinks), per se.

705 By specific coating:
This subclass is indented under subclass 704. Subject matter wherein a particular support surface layer dissipates heat from heat producing electrical components.

706 Containing silicon or aluminum:
This subclass is indented under subclass 705. Subject matter wherein the coating contains an earth metal and element of atomic number 13 or contains a nonmetallic element of a carbon group, atomic number 14.

707 Through support means:
This subclass is indented under subclass 704. Subject matter wherein heat is conducted through the means supporting or upholding components of the electronic system or device.

708 Specific chemical compound or element:
This subclass is indented under subclass 707. Subject matter wherein the support means is composed of a particular substance.

709 Heat sink:
This subclass is indented under subclass 707. Subject matter wherein the support means is connected to a mass of metal that is added to an electrical device for the absorption or transfer of warmth from electrical parts.

SEE OR SEARCH THIS CLASS, SUBCLASS:
702, for electronic systems with liquid cooling means and having a heat sink.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for heat conducting members (heat sinks), per se.

710 Details:
This subclass is indented under subclass 709. Subject matter wherein the heat sink is a complex unit having specific parts.

711 Cooling plate or bar:
This subclass is indented under subclass 709. Subject matter wherein the heat sink is combined with a flat surface or straight piece of metal that conducts heat.

SEE OR SEARCH THIS CLASS, SUBCLASS:
702, for electronic system with liquid cooling means and having a cold plate.

712 Thermally and electrically conductive:
This subclass is indented under subclass 707. Subject matter wherein the support means conduct heat and flow of electrons.

713 Electrically insulating thermally conductive:
This subclass is indented under subclass 707. Subject matter wherein the support means conduct heat and does not conduct flow of electrons.

714 Through component housing:
This subclass is indented under subclass 704. Subject matter wherein the heat conduction is through the housing which supports the electronic components.

SEE OR SEARCH THIS CLASS, SUBCLASS:
707+, for thermal conduction through component support means.

715 For module:
This subclass is indented under subclass 704. Subject matter wherein the heat is conducted from components separately housed in a container or supported in a unit or packaging scheme displaying regularity and separable repetition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
728+, for module without cooling means.

716 Plural:
This subclass is indented under subclass 715. Subject matter wherein the heat is conducted from components separately housed in containers or supported in several units.

SEE OR SEARCH THIS CLASS, SUBCLASS:
729+, for plurality of module units that are electrically connected in groups without cooling means.

717 For active solid state devices:
This subclass is indented under subclass 704. Subject matter wherein the heat is conducted from semiconductive devices.

SEE OR SEARCH THIS CLASS, SUBCLASS:
764, for integrated circuit within printed circuit board with no cooling means and having no structural details to an active solid state device.
783, for semiconductive device connected to printed circuit board with no cooling means and having no structural details to semiconductive device.
820, for electronic system or device support/housing and having at least one semiconductor device as a component without cooling means.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 712+ for cooling of semiconductor device wherein (a) the housing is for an active solid-state device, details of which are positively recited in the claims or (b) wherein the recited housing is necessary to make a usable active solid-state device.

718 For integrated circuit:
This subclass is indented under subclass 717. Subject matter wherein the heat is conducted from an electrical network composed of two or more circuit elements inextricably bound on a single semiconductor substrate.

SEE OR SEARCH THIS CLASS, SUBCLASS:
764, for integrated circuit within printed circuit board without cooling means.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclass for integrated circuits, per se.

719 Circuit board mounted:
This subclass is indented under subclass 718. Subject matter wherein the integrated circuit is mounted on a card, chassis, or plate onto which an electrical circuit or network has been printed and has a heat conducting means for cooling.

SEE OR SEARCH THIS CLASS, SUBCLASS:
748+, for printed circuit with diverse components having no cooling means.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 250+ for printed circuit board, per se, and subclass 260 for printed circuit board having one component.

720 For printed circuit board:
This subclass is indented under subclass 704. Subject matter wherein an insulated card, chassis or plate is utilized to support diverse electrical components in an interconnected relationship and having heat conducting means for cooling.

SEE OR SEARCH THIS CLASS, SUBCLASS:
719, for integrated circuit mounted on printed circuit board and having heat conducting means for cooling.

748+, for printed circuit with diverse components having no cooling means.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 250+ for printed circuit board, per se, and subclass 260 for printed circuit board having one component.

721 Plural:

This subclass is indented under subclass 720. Subject matter wherein two or more printed circuit boards are utilized to support diverse electrical components in an interconnected relationship and having heat conduction for cooling.

SEE OR SEARCH THIS CLASS, SUBCLASS:

784, for plural printed circuit boards having no cooling means.

722 For electronic circuit:

This subclass is indented under subclass 704. Subject matter wherein a number of electrical components or devices are interconnected in one or more closed path(s) to perform a desired electrical or electronic function and having heat conduction for cooling.

723 For lead frame:

This subclass is indented under subclass 704. Subject matter wherein a metal skeletal structure is utilized to support diverse components and having heat conduction as cooling means.

(1) Note. Lead frame in Class 257 is defined as a semiconductor device combined with housing wherein the contact is part of a network of leads suspended from a common lead.

SEE OR SEARCH THIS CLASS, SUBCLASS:

813, for lead frame utilized to support diverse components and having no cooling means.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclass 52.4 for lead frame devices with housing means but having no claimed characteristics limiting particular characters of electrical equipment classifiable in other main classes.

724 Cabinet-type housing:

This subclass is indented under subclass 679. Subject matter comprising a box or housing having drawers or doors with structure to support readily accessible electrical components.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 50+ for boxes and housings limited by claimed structure to electrical, but having no characteristic limiting them to a particular electrical equipment.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 678+ for details of active solid-state devices combined with housing.

312, Supports: Cabinet Structure, appropriate subclass for cabinet structure, per se.

348, Television, subclasses 273+ for a television camera with housing or support and subclasses 787+, 789, and 836+ for a television projection or display device with cabinet or chassis structure.

455, Telecommunications, subclasses 347+ for cabinet, casing, housing means, and combinations thereof peculiar to or adapted to house, electrically shield or support radio receiver systems or components thereof.

725 With retractable or readily detachable chassis:

This subclass is indented under subclass 724. Subject matter wherein a structure is provided to retract, hinge, or detach support means within a cabinet structure.

SEE OR SEARCH CLASS:

211, Supports: Racks, appropriate subclass for supports and racks, per se, and subclass 26 for electrical fixture supports.

312, Supports: Cabinet Structure, subclasses 294+ for supports and cabinets with movable components.

455, Telecommunications, subclass 348 for radio receiver means with retractable or readily detachable chassis means.

726 With locking means or device:
This subclass is indented under subclass 725. Subject matter wherein a cabinet component is fastened or made secure with a locking or securing device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
732, for modules with lock or interlock.
740, for printed circuit boards contained in a module having locking means or device.
747, for single module with locking means or device.
759, for printed circuit board with housing or chassis and having lock or interlock.

SEE OR SEARCH CLASS:
70, Locks, subclasses 85+ for drawer locks and subclasses 95+ for locks on sliding doors.
312, Supports: Cabinet Structure, subclass 215 for a plurality of components having individual locks or latches actuated by a single selector or by a group of remote operators, subclasses 216+ for a gang-bar type lock or latch for plural movable components, and subclass 222 for locks or latches for a component.

727 Sliding component or compartment:
This subclass is indented under subclass 725. Subject matter wherein the cabinet contains a part that moves smoothly along a surface of the cabinet to permit easy access.

SEE OR SEARCH CLASS:
312, Supports: Cabinet Structure, subclass 119 for cabinet with sliding compartment, per se.

728 Module:
This subclass is indented under subclass 679. Subject matter wherein the electrical components are separately housed in a container or supported in a unit or packaging scheme displaying regularity and separable repetition.

SEE OR SEARCH THIS CLASS, SUBCLASS:
715+, for electronic system with module and having thermal conductive cooling means.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 50+ for electrical boxes and housings of the hermetically sealed envelope type and subclasses 250+ for preformed circuit arrangements, per se.
439, Electrical Connectors, subclasses 55+ for detachable connectors of preformed panel circuit arrangements (e.g., printed circuit devices).
455, Telecommunications, subclass 349 for receiver components housed in separate containers or units.

729 Plural:
This subclass is indented under subclass 728. Subject matter wherein two or more module units are electrically connected in groups.

SEE OR SEARCH THIS CLASS, SUBCLASS:
716, for plural modules having cooling means through component housing.

730 With housing:
This subclass is indented under subclass 729. Subject matter wherein a panel or chassis is provided to mount a plurality of modules in an interconnected relationship.

731 Interchangeable:
This subclass is indented under subclass 730. Subject matter wherein one module can be substituted for another within the module housing.

732 Having lock or interlock:
This subclass is indented under subclass 730. Subject matter wherein the modules are fastened or made secure within the housing.

SEE OR SEARCH THIS CLASS, SUBCLASS:
726, for cabinet-type housing with retractable or readily detachable chassis having locking means or locking device.

740, for printed circuit boards contained in a module having locking means or device.
741, for single module with locking means or device.
759, for printed circuit board with housing or chassis and having a lock or interlock.

SEE OR SEARCH CLASS:
70, Locks, subclasses 85+ for drawer locks and subclasses 95+ for locks on sliding doors.
312, Supports: Cabinet Structure, subclass 215 for a plurality of components having individual locks or latches actuated by a single selector or by a group of remote operators, subclasses 216+ for a gang-bar type lock or latch for plural movable components, and subclass 222 for locks or latches for a component.

733 Selective connections:
This subclass is indented under subclass 730. Subject matter wherein electrical connections are from (a) module to module or (b) module to housing and may be chosen from a group of possible connections.

734 With coupling or decoupling capacitor:
This subclass is indented under subclass 729. Subject matter wherein an electrical energy storage device is used to allow alternating current to pass to a module or an electrical energy storage device is used to prevent unwanted current to a module.

SEE OR SEARCH THIS CLASS, SUBCLASS:
268+, for transformers and inductors with integral switches, capacitors, or locks.
271+, for electrostatic capacitors, per se.

735 Stacked:
This subclass is indented under subclass 729. Subject matter wherein the modules are arranged one on top of another to formulate a pile.

SEE OR SEARCH THIS CLASS, SUBCLASS:
790, for stacked printed circuit boards having separable connector or socket means.

736 With printed circuits boards:
This subclass is indented under subclass 728. Subject matter wherein the module is constructed primarily of insulating panels wherein conductors are applied thereto by coating, laminating, or bonding in such a manner that the conductors are permanently attached to the panels.

SEE OR SEARCH THIS CLASS, SUBCLASS:
719, for integrated circuit mounted on a printed circuit board and having heat conducting means for cooling.
748, for printed circuit not in a module having no cooling means.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 250+ for printed circuit board, per se, and for printed circuit board having one component.

737 IC card or card member:
This subclass is indented under subclass 736. Subject matter wherein the printed circuit board supports an electrical network composed of two or more circuit elements inextricably bound on a single semiconductor substrate.

738 With resistor and capacitor:
This subclass is indented under subclass 736. Subject matter wherein at least a component that has a specified opposition to a flow of electrical current and an electrical energy storage device are connected to the printed circuit board.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271+, for capacitors, per se.
763, for capacitor and resistor within printed circuit board.
766, for capacitor and resistor coated on printed board.

782, for passive component in conjunction with another electrical component on printed circuit board not in a module.
830, for plurality of capacitors on a frame.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 260 for printed circuit with a capacitor or a resistor.

739 With particular material:
This subclass is indented under subclass 736. Subject matter wherein at least a part of the circuit board structure is composed of one or more specific substances.

SEE OR SEARCH THIS CLASS, SUBCLASS:
751, for a printed circuit not associated with a module and having a particular material.
757, for printed circuit board housing with a particular material.
771, for printed circuit board not contained in a module with a mounting pad and having a particular material.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 256 for particular material of printed circuit board without diverse electrical components.

740 With locking means or device:
This subclass is indented under subclass 736. Subject matter wherein the module is fastened or made secure to a support.

SEE OR SEARCH THIS CLASS, SUBCLASS:
726, for cabinet-type housing with locking means or device.
732, for plural modules having a lock or interlock.
747, for single module with locking means or device.
759, for printed circuit board not contained in module with housing or chassis and having lock or interlock.

SEE OR SEARCH CLASS:
70, Locks, subclasses 85+ for drawer locks and subclasses 95+ for locks on sliding doors.
312, Supports: Cabinet Structure, subclass 215 for a plurality of components having individual locks or latches actuated by a single selector or by a group of remote operators, subclasses 216+ for a gang-bar type lock or latch for plural movable component, and subclass 222 for locks or latches for a component.

741 Guiding means:
This subclass is indented under subclass 736. Subject matter wherein a support for the circuit boards contain parts that direct a motion of the circuit board.

SEE OR SEARCH THIS CLASS, SUBCLASS:
756, for printed circuits not contained in modules and having guiding means.
802, for plural printed circuit boards not contained in module with housing or chassis and having specific guiding means.

742 With spacer:
This subclass is indented under subclass 736. Subject matter wherein a surface or barrier (used to maintain circuit boards a uniform distance from each other) is designed specifically for use with the printed circuit boards.

SEE OR SEARCH THIS CLASS, SUBCLASS:
758, for spacer with circuit boards not contained in module.
770, for spacer with circuit board not contained in module and having a mounting pad.
804, for spacer details with plural printed circuit boards not contained in module.

743 Solder connection:
This subclass is indented under subclass 736. Subject matter wherein at least part of the printed circuit board's component(s) is interconnected with a readily meltable metal or alloy that produces a bond at a junction of two metal surfaces.

744 This subclass is indented under subclass 736. Subject matter wherein diverse discrete components are mounted between and perpendicu-

lar to two parallel printed circuit boards to which their terminals are attached.

745 Welded connection:
This subclass is indented under subclass 744. Subject matter wherein at least one electrical component's metal lead is (a) consolidated by an application of heat to another electrical component's metal lead or (b) consolidated by an application of heat to a metal support.

SEE OR SEARCH CLASS:
219, Electric Heating, subclasses 50+ for electric welding, per se.

746 With specific dielectric material or layer:
This subclass is indented under subclass 728. Subject matter wherein the module contains a particular insulating medium which intervenes between two conductors and permits electrostatic attraction and repulsion to take place across the conductors.

SEE OR SEARCH THIS CLASS, SUBCLASS:
301+, for dielectric capacitors, per se.
750, for dielectric material or layer on flexible printed circuit board not contained in module.
762, for dielectric material or layer with printed circuit board not contained in module having housing or chassis.
795, for plural contiguous printed circuit boards not contained in module having separate layers of dielectric material.

SEE OR SEARCH CLASS:
252, Compositions, appropriate subclass for fluent dielectric, per se.

747 With locking means or device:
This subclass is indented under subclass 728. Subject matter wherein the module is fastened or made secure to a support.

SEE OR SEARCH THIS CLASS, SUBCLASS:
726, for cabinet-type housing with locking means or device.
732, for modules having lock or interlock.
740, for printed circuits contained in module with lock or locking device.
759, for printed circuit board not contained in module with housing or chassis and having lock or interlock.

SEE OR SEARCH CLASS:
70, Locks, subclasses 85+ for drawer locks and subclasses 95+ for locks on sliding doors.
312, Supports: Cabinet Structure, subclass 215 for a plurality of components having individual locks or latches actuated by a single selector or by a group of remote operators, subclasses 216+ for a gang-bar type lock or latch for plural movable components, and subclass 222 for locks or latches for a component.

748 Printed circuit board:
This subclass is indented under subclass 679. Subject matter comprising an insulating panel wherein conductors are applied thereto by coating, laminating, or bonding in such a manner that the conductors are permanently attached to the panel.

SEE OR SEARCH THIS CLASS, SUBCLASS:
720+, for printed circuit board utilized to support diverse electrical components in an interconnected relationship and having heat conduction cooling means.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 250+ for printed circuit board, per se, and subclass 260 for printed circuit board having one component.

749 Flexible board:
This subclass is indented under subclass 748. Subject matter wherein the printed circuit board is constructed of an elastic material.

750 With specific dielectric material or layer:
This subclass is indented under subclass 749. Subject matter wherein the flexible printed circuit board contains a particular insulating medium which intervenes between two conductors and permits electrostatic attraction and repulsion to take place across the conductors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

301+, for dielectric capacitor, per se.

746, for dielectric material or layer contained in module.

762, for dielectric material or layer with printed circuit board not contained in module having housing or chassis.

795, for plural contiguous printed circuit boards not contained in module having separate layers of dielectric material.

SEE OR SEARCH CLASS:

252, Compositions, appropriate subclass for fluent dielectric, per se.

751 With particular conductive material or coating:

This subclass is indented under subclass 749. Subject matter wherein at least a part of the flexible circuit board structure contains (a) one or more specific electrical transmitting substances or (b) one or more specific electrical transmitting films or coatings.

SEE OR SEARCH THIS CLASS, SUBCLASS:

739, for printed circuits in modules with particular material.

757, for printed circuit board not contained in module with housing or chassis and having a particular material.

771, for printed circuit board with a mounting pad and having a particular material.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclass 256 for particular material of printed circuit board without diverse electrical components.

752 With housing or chassis:

This subclass is indented under subclass 748. Subject matter wherein a casing, enclosure, or sheet metal box supporting the printed circuit board has structural details of casing, enclosure, or sheet metal box.

SEE OR SEARCH THIS CLASS, SUBCLASS:

736, for modular housing units which include printed circuit boards having structural details of casing, housing, or chassis.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 50+ for boxes and housings limited by structure to electrical use, but having no characteristic limiting them to particular electrical equipment.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 678+ for details of active solid-state devices combined with housing.

753 Specific chassis or ground:

This subclass is indented under subclass 752. Subject matter comprising a particular electrical connection from the printed circuit board to a metal supporting structure.

754 With ejector means:

This subclass is indented under subclass 752. Subject matter comprising a device or mechanism utilized to remove the printed circuit board from the housing or chassis.

755 Rotatable:

This subclass is indented under subclass 752. Subject matter wherein a member of the housing or chassis turns about an axis or center.

756 Guiding means:

This subclass is indented under subclass 752. Subject matter wherein the printed circuit board housing or chassis contains parts that direct the motion of the printed circuit board, away or to the housing or chassis.

SEE OR SEARCH THIS CLASS, SUBCLASS:

741, for module with printed circuits and having guiding means.

802, for plural printed circuit boards with housing or chassis and having specific guiding means.

757 With particular material:
This subclass is indented under subclass 752. Subject matter wherein at least a part of the printed circuit board housing or chassis is composed of one or more specific substances.

SEE OR SEARCH THIS CLASS, SUBCLASS:
739, for printed circuits in modules with particular material.
751, for flexible printed circuit board not contained in module and having a particular material or coating.
771, for printed circuit board not contained in a module with a mounting pad and having a particular material.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 256 for particular material of printed circuit board without diverse electrical components.

758 With spacer:
This subclass is indented under subclass 752. Subject matter wherein a surface or barrier (that maintain circuit boards a uniform distance from each other) is designed specifically for use with the printed circuit board.

SEE OR SEARCH THIS CLASS, SUBCLASS:
742, for spacer with circuit boards contained in module.
770, for spacer with circuit board not contained in module and having a mounting pad.
804, for spacer details with plural printed circuit boards.

759 With lock or interlock:
This subclass is indented under subclass 752. Subject matter wherein the printed circuit board is fastened or made secure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
726, for cabinet-type housing with locking means or device.
732, for modules with lock or interlock.
740, for printed circuit boards contained in a module having locking means or device.
747, for single module with locking means or device.

SEE OR SEARCH CLASS:
70, Locks, subclasses 85+ for drawer locks and subclasses 95+ for locks on sliding doors.
312, Supports: Cabinet Structure, subclass 215 for a plurality of components having individual locks or latches actuated by a single selector or by a group of remote operators, subclasses 216+ for a gang-bar type lock or latch for plural movable components, and subclass 222 for locks or latches for a component.

760 Connection of components to board:
This subclass is indented under subclass 748. Subject matter wherein a specific structure is provided to facilitate interconnecting diverse components to the printed circuit board.

SEE OR SEARCH THIS CLASS, SUBCLASS:
807+, for structure facilitating connection of components to a support other than a printed circuit board.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 832+ for processes including mounting of an electrical device to a printed circuit board.

761 Component within printed circuit board:
This subclass is indented under subclass 760. Subject matter comprising a slot or aperture within the printed circuit board for receiving the component.

762 With specific dielectric material or layer:
This subclass is indented under subclass 761. Subject matter wherein the printed circuit board contains a particular insulating medium which intervenes between two conductors and permits electrostatic attraction and repulsion to take place across it.

SEE OR SEARCH THIS CLASS, SUBCLASS:
301+, for dielectric capacitors, per se.
746, for dielectric material obtained in module.

750, for dielectric material on flexible printed circuit board not contained in module.

795, for plural contiguous printed circuit boards not contained in module having separate layers of dielectric material.

SEE OR SEARCH CLASS:

252, Compositions, appropriate subclass for fluent dielectric, per se.

763 Capacitor and electrical component:

This subclass is indented under subclass 761. Subject matter comprising an electrical energy storage device and a resistor, inductor, diode, or semiconductor device within the printed circuit board.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271+, for capacitor, per se.

738, for resistor and capacitor on printed circuit board with module.

766, for capacitor and resistor coated on printed circuit board.

782, for passive component in conjunction with another electric component on printed circuit board not in module.

821, for electronic system or device support/housing having at least one capacitor and at least one inductor.

830, for plurality of capacitors on a frame.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclass 260 for printed circuit with a capacitor or an electrical component.

764 Integrated circuit:

This subclass is indented under subclass 761. Subject matter comprising an electrical network composed of two or more circuit elements inextricably bound on a single semiconductor substrate within the printed circuit board having no structural details to the electrical network.

SEE OR SEARCH THIS CLASS, SUBCLASS:

718, for integrated circuit having heat conduction as cooling means with no structural details to integrated circuit.

783, for semiconductive device connected to printed circuit board with no structural details to semiconductive device.

820, for electronic system or device support/housing having at least one semiconductor device as a component.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 678+ for semiconductor device wherein (a) the housing is for an active solid-state device, details of which are positively recited in the claims, or (b) wherein the recited housing is necessary to make a usable active solid-state device.

765 By direct coating of components on board:

This subclass is indented under subclass 760. Subject matter wherein diverse electrical components are directly coated, deposited, or screened on the board.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 9+ for components coated on a base wherein the device has a layer of a thickness less than two microns in the conduction path or the device is specified to be a thin film device.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclass 567 for devices including a thin layer of conductive or semiconductive material of atomic dimensions which act as a nonlinear element.

766 Capacitor and resistor:

This subclass is indented under subclass 765. Subject matter comprising (a) at least an electrical energy storage device and (b) an electrical component with specified opposition to a flow of electrical current are coated on the printed circuit board.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271+, for capacitor, per se.

738, for capacitor and resistor on printed circuit board in a module.

766, for capacitor and electrical component on printed circuit board not in module.
782, for passive component in conjunction with another electrical component on printed circuit board not in module.
821, for electronic system or device support/housing having at least one capacitor and at least one inductor.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 260 for printed circuit with a capacitor or an electrical component.

767 With mounting pad:
This subclass is indented under subclass 752. Subject matter wherein an intermediate support fixed to the printed circuit is utilized as a carrier or pad for electrical components to facilitate connection thereof to the printed circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
808, for mounting pad structure not utilized with a printed circuit board.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 52.1+ for mounting pad structure, per se.
324, Electricity: Measuring and Testing, subclass 158 for mounting structure utilized in conjunction with measuring and testing devices having details of measuring and testing devices.

768 Having leadless component:
This subclass is indented under subclass 767. Subject matter wherein the mounting pad provides a mounting surface for electrical carriers or substrates without connection wires.

769 Having spring member:
This subclass is indented under subclass 767. Subject matter wherein (a) an elastic or resilient device or mechanism assures good electrical contact with a conductor and a component or (b) an elastic or resilient device or mechanism serves as a stop for limiting relative movement between separable portions of a connector structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:
787, for plural circuit board housing having spring connection member.

770 Having spacer:
This subclass is indented under subclass 767. Subject matter wherein a surface or barrier, that maintain printed circuit boards in a uniform distance from each other, is designed specifically for use with the printed circuit boards.

SEE OR SEARCH THIS CLASS, SUBCLASS:
742, for spacer with circuit boards contained in module.
758, for spacer with circuit board not contained in module and having housing or chassis.
804, for spacer details with plural printed circuit boards.

771 With particular material:
This subclass is indented under subclass 767. Subject matter wherein at least a part of the printed circuit board housing is composed of one or more specific substances.

SEE OR SEARCH THIS CLASS, SUBCLASS:
739, for printed circuits contained in modules with particular material.
751, for flexible printed circuit board not contained in module and having a particular material or coating.
757, for printed circuit board not contained in module with housing or chassis and having a particular material.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 256 for particular material of printed circuit board without diverse electrical components.

772 With specific lead configuration:
This subclass is indented under subclass 760. Subject matter wherein a particular connection wire structure is provided for facilitating connection between the components and the printed circuit board.

773 Shaped lead on components:
This subclass is indented under subclass 772. Subject matter wherein the connection wire is located on the components.

774 Shaped lead on board:
This subclass is indented under subclass 772. Subject matter wherein the connection wire is located on the printed circuit board.

SEE OR SEARCH THIS CLASS, SUBCLASS:
809, for structure that facilitates connection of plural components not located on a printed circuit board.

775 Busbar:
This subclass is indented under subclass 772. Subject matter wherein the connection wire is a single conductive member supplying a plurality of spaced electrical components.

776 Flexible connecting lead:
This subclass is indented under subclass 772. Subject matter wherein the connection wire structure comprises a flexible or resilient electrical conductor.

777 By specific pattern on board:
This subclass is indented under subclass 760. Subject matter wherein the lead structure provided for facilitating connection comprises a specific geometric arrangement of printed conductors on the printed circuit board.

778 Cross-connected:
This subclass is indented under subclass 777. Subject matter wherein a specific geometric arrangement comprises an array of crossing conductors disposed of within a same plane.

779 With specific connection material:
This subclass is indented under subclass 777. Subject matter wherein the arrangement of conductors comprises a material or substance in or on a conductor to facilitate connection of the components therefor.

SEE OR SEARCH THIS CLASS, SUBCLASS:
803, for plural printed circuit boards with interconnection details.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 734+ for active solid-state devices (e.g., transistors, integrated circuit with significant contact structure or material, etc.).
439, Electrical Connectors, appropriate subclass for electrical connectors, per se.

780 Different voltage layers:
This subclass is indented under subclass 760. Subject matter wherein the printed circuit board contains layers or strips having unequal electric potentials.

781 With switch:
This subclass is indented under subclass 760. Subject matter wherein the printed circuit board contains at least a mechanical or electrical device that completes or breaks the path of current or sends it over a different path as one of its electrical components.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, appropriate subclasses for switches and circuit breakers, per se.

782 Having passive component:
This subclass is indented under subclass 760. Subject matter wherein the printed circuit board contains at least a capacitor, inductor, or resistor as one of its electrical components.

(1) Note. Printed circuit board must also contain another electrical component in conjunction with a passive component to be classified in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
738, for resistor and capacitor on printed circuit board with module.
763, for capacitor and electrical component within printed circuit board not with module.
766, for capacitor and resistor coated on printed circuit board.
830, for plurality of capacitors on a frame.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclass 260 for printed circuit with one electrical component.

783 Having semiconductive device:

This subclass is indented under subclass 760. Subject matter wherein a component connected to the printed circuit board is an active solid state device having no structural details to an active solid state device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

717+, for an active solid state device with support or housing having thermal conduction cooling means with no structural details to an active solid state device.

764, for integrated circuit within printed circuit board with no cooling means and having no structural details to active solid state device.

820, for electronic system or device support/housing and having at least one semiconductor device as a component with no structural details to an active solid state device.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 678+ for semiconductor device wherein (a) the housing is for an active solid-state device, details of which are positively recited in the claims, or (b) wherein the recited housing is necessary to make a usable active solid-state device.

784 Plural:

This subclass is indented under subclass 748. Subject matter wherein two or more printed circuit boards are utilized to support a plurality of diverse electrical components in an interconnected relationship.

785 With separable connector or socket means:

Subject matter under 784 wherein each printed circuit board can be distinctly detached from the mount or support.

SEE OR SEARCH CLASS:

439, Electrical Connectors, subclasses 43+ for connector with selectable circuits and subclasses 55+ for connector with preformed panel circuit arrangement.

786 Having key connection:

This subclass is indented under subclass 785. Subject matter comprising a mechanical arrangement of guide pins, sockets, contacts, slots, inserts, or grooves in the mount or support which allows the connector to be lined up without a danger of making a wrong connection.

787 Having spring member:

This subclass is indented under subclass 785. Subject matter wherein (a) an elastic or resilient device or mechanism assures good electrical contact with a conductor and a component or (b) an elastic or resilient device or mechanism serves as a stop for limiting relative movement between separable portions of the connector structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

769, for single printed circuit board with mounting pad and having spring connection member.

788 Having backplane connection:

This subclass is indented under subclass 785. Subject matter wherein the printed circuit boards are connected to an equipment's rear panel.

789 Having flexible connector:

This subclass is indented under subclass 785. Subject matter wherein the separable connector's contact, socket, terminal, or groove comprises an elastic or resilient electrical conductor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

776, for flexible connecting lead on single printed circuit board with housing.

790 Stacked:
This subclass is indented under subclass 785. Subject matter wherein the printed circuit boards are arranged one on top of another to formulate a pile.

SEE OR SEARCH THIS CLASS, SUBCLASS:
735, for stacked modules with housing.

791 Multiple contact pins:
This subclass is indented under subclass 785. Subject matter wherein the separable connectors comprise posts or pins arranged in arrays or rows.

792 Plural contiguous boards:
This subclass is indented under subclass 784. Subject matter wherein two or more printed circuit boards have surfaces that are adjacent and in physical contact with each other.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 250+ for printed circuit board, per se.

793 Thick film component or material:
This subclass is indented under subclass 792. Subject matter wherein a conductive, resistive, or capacitive component, network, or layer is deposited on a substrate using a metallic or resistive coating which is more than five (5) micrometers in thickness.

794 Power, voltage, or current layer:
This subclass is indented under subclass 792. Subject matter wherein a surface on or within the printed circuit board is used to supply electrical energy to electrical components mounted on or within the printed circuit board.

SEE OR SEARCH THIS CLASS, SUBCLASS:
601+, for housing or mounting assemblies for electrical power distribution system and devices, per se.

795 Plural dielectric layers:
This subclass is indented under subclass 792. Subject matter wherein the printed circuit boards contain two or more separate insulating mediums which intervene between two conductors and permit electrostatic attraction and repulsion to take place across them.

SEE OR SEARCH THIS CLASS, SUBCLASS:
301+, for dielectric capacitors, per se.
746, for dielectric material contained in module.
750, for dielectric material on flexible printed circuit board.
762, for dielectric layer on printed circuit board having component within printed circuit board combined with chassis or housing.

SEE OR SEARCH CLASS:
252, Compositions, appropriate subclass for fluent dielectric, per se.

796 With housing or chassis:
This subclass is indented under subclass 784. Subject matter wherein a casing, enclosure, or sheet metal box is provided to support a plurality of printed circuit boards.

SEE OR SEARCH THIS CLASS, SUBCLASS:
730, for housings containing plural modules which may or may not comprise printed circuits.

SEE OR SEARCH CLASS:
211, Supports: Racks, subclasses 41.1+ for frame structure designed to support plates or plate-like articles not specifically designated as printed circuits.

797 Storage or file cabinet:
This subclass is indented under subclass 796. Subject matter wherein the housing or casing is used for a safekeeping or protection of the printed circuit boards.

798 With ejector or extractor:
This subclass is indented under subclass 796. Subject matter wherein the housing or chassis is equipped with a mechanism that disengages the printed circuit boards from the housing or chassis.

799 Grounding construction or detail:
This subclass is indented under subclass 796. Subject matter wherein the housing or chassis contains particular or specified circuitry, that connects to earth.

800 With shielding structure:
This subclass is indented under subclass 796. Subject matter wherein the housing or chassis is provided: (a) With means for protecting at least part of the devices from external electric or magnetic fields, or (b) with means to protect one or more elements of the device from electric or magnetic fields generated in one or more other parts of a system, or (c) with protecting or screening means to prevent radiation of undesired electric or magnetic fields generated within systems.

SEE OR SEARCH THIS CLASS, SUBCLASS:
816, for diverse electrical components housing and support with shielding, per se.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclasses 32+ for miscellaneous anti-inductive structures, particularly indented subclasses 35+ for miscellaneous electrical shields and screen structures not elsewhere classifiable.
307, Electrical Transmission or Interconnection Systems, subclass 91 for anti-induction or coupling to other systems with magnetic or electrostatic field control (e.g., shielding).
315, Electric Lamp and Discharge Devices: Systems, subclass 85 for gaseous tube systems with electromagnetic wave radiation prevention or shielding means.
330, Amplifiers, subclass 68 for amplifiers with shielding means.
331, Oscillators, subclass 67 for oscillators combined with electromagnetic or electrostatic shield means.
333, Wave Transmission Lines and Networks, subclass 12 for transmission line inductive or radiation interference systems.
334, Tuners, subclass 85 for radio tuners with shielding means.
336, Inductor Devices, subclass 84 for induction devices with electric or magnetic shielding means.
338, Electrical Resistors, subclass 64 for electrical resistors with electrical shielding means.
343, Communications: Radio Wave Antennas, subclasses 841+ for antenna structure with electric shielding means.
348, Television, subclasses 818+ for a cathode-ray tube with protective means.
439, Electrical Connectors, subclass 497 for connector including tape cable with shield and subclasses 607+ for connector having or providing inductive or capacitive shield.

801 Specific latching or retaining device:
This subclass is indented under subclass 796. Subject matter wherein the chassis or housing comprises a particular fastener or holding device that secures the printed circuit boards to the chassis or housing.

(1) Note. Locks are considered to be latches or retaining devices for this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:
726, for cabinet-type housing with locking means or device.
732, for plural modules having lock or interlock.
747, for single module with locking means or device.
759, for printed circuit board with housing or chassis and having lock or interlock.

SEE OR SEARCH CLASS:
70, Locks, subclasses 85+ for drawer locks and subclasses 95+ for locks on sliding doors.
312, Supports: Cabinet Structure, subclass 215 for a plurality of components having individual locks or latches actuated by a single selector or by a group of remote operators, subclasses 216+ for a gang-bar type look or latch for plural movable component actuated by another component, and

subclass 222 for locks or latches for a component.

802 Specific alignment or guide means:
This subclass is indented under subclass 796. Subject matter wherein the housing or chassis contain parts that (a) direct the motion of the printed circuit boards or (b) aid in the proper positioning of the printed circuit boards.

SEE OR SEARCH THIS CLASS, SUBCLASS:
741, for module with printed circuit and having guiding means.
756, for printed circuits not contained in modules and having guiding means.

803 Interconnection details:
This subclass is indented under subclass 784. Subject matter wherein a conductive path or connecting line between the printed circuit boards has specific details.

SEE OR SEARCH THIS CLASS, SUBCLASS:
778, for single printed circuit board with housing or chassis and having cross-connect arrangement.
779, for single printed circuit board with housing or chassis and having a specific connection material.

SEE OR SEARCH CLASS:
439, Electrical Connectors, appropriate subclass for electrical connectors, per se.

804 Spacer details:
This subclass is indented under subclass 784. Subject matter wherein surfaces or barriers used to maintain the printed circuit boards in a uniform distance from each other are described thoroughly.

SEE OR SEARCH THIS CLASS, SUBCLASS:
742, for spacer with circuit boards contained in a module.
758, for circuit boards not contained in a module with housing or chassis and having a spacer.
770, for spacer with circuit board not contained in module and having mounting pad.

805 Matrix assembly:
This subclass is indented under subclass 679. Subject matter comprising a plurality of diverse electrical components connected by crossed gratings and located at intersections of conductors.

SEE OR SEARCH CLASS:
335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 107+ for electromagnetically operated selector devices.
340, Communications: Electrical, subclasses 2.2 through 2.31 for a channel selecting matrix and subclasses 14.1-14.69 for a decoder matrix.

806 Diode:
This subclass is indented under subclass 805. Subject matter wherein the matrix assembly contains a plurality of electrical devices that will conduct electricity much more easily in one direction than in the other.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 40 through 43 for diodes, per se.

807 Component mounting or support means:
This subclass is indented under subclass 679. Subject matter wherein an upholding structure or chassis is utilized to hold a plurality of diverse electrical components in an interconnected relationship.

SEE OR SEARCH THIS CLASS, SUBCLASS:
748+, for component mounting means wherein the support is a printed circuit board.

808 Mounting pad:
This subclass is indented under subclass 807. Subject matter wherein an intermediate support connected to the support or mount is utilized as a carrier for electrical components.

SEE OR SEARCH THIS CLASS, SUBCLASS:
767+, for mounting pad structure specifically for use with a printed circuit.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 52.1+ for mounting pad, per se.

324, Electricity: Measuring and Testing, subclass 158 for mounting structure utilized in conjunction with measuring and testing devices.

809 With discrete structure or support:

This subclass is indented under subclass 807. Subject matter wherein means are provided on the chassis or support to facilitate connection of the components thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:

774, for component lead structure on a printed circuit board.

810 Plural mounting or support:

This subclass is indented under subclass 807. Subject matter wherein two or more supporting means or chassis means are provided to support diverse electrical components.

SEE OR SEARCH THIS CLASS, SUBCLASS:

784+, for plural printed circuit boards.

811 With passive components:

This subclass is indented under subclass 807. Subject matter wherein support or chassis is utilized to mount resistors, capacitors, or inductors in an interconnected relationship.

812 With particular insulation:

This subclass is indented under subclass 807. Subject matter wherein a support or chassis is utilized to mount a plurality of diverse electrical components in an interconnected relationship and having details of a nonconductive material that prevents the leakage of electricity from a conductor or protects against accidental contact.

813 Lead frame:

This subclass is indented under subclass 679. Subject matter wherein a metal skeletal structure is utilized to support a plurality of diverse electrical components, portions of a metal skeletal structure being removed to provide connecting paths.

(1) Note. Lead frame in Class 257 is defined as a semiconductor device combined with housing wherein the contact is part of a network of leads suspended from a common lead.

SEE OR SEARCH THIS CLASS, SUBCLASS:

723, for electronic system housing or support with thermal conductive cooling and having a lead frame.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclass 52.4 for lead frame devices with housing means but having no claimed characteristics limiting the same to particular features of electrical equipment classifiable in other main classes.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 666+ for lead frame. See (1) Note, above.

814 Radio type:

This subclass is indented under subclass 679. Subject matter comprising communication type devices having no significant art limitations and such devices in combination with diverse pieces of electrical apparatus wherein the combination is not provided for in any other class or in other subclasses of this class.

SEE OR SEARCH CLASS:

312, Supports: Cabinet Structure, subclasses 7.1+ for cabinets or enclosures specially designed to house radios, phonograph instruments, or records having no electrical components or devices.

331, Oscillators, subclass 187 for miscellaneous oscillator structures.

455, Telecommunications, subclasses 347+ for housings, cabinets, or chassis combined with specific functional details or structure of a receiver.

815 Tube mounting:

This subclass is indented under subclass 814. Subject matter wherein a support or chassis means is structurally connected to a tube socket.

SEE OR SEARCH CLASS:

439, Electrical Connectors, appropriate subclass for tube sockets, per se.

816 Shielding:

This subclass is indented under subclass 679. Subject matter wherein the electronic systems and devices are provided: (a) With means for protecting at least part of the devices from external electric or magnetic fields; (b) with means to protect one or more elements of the device from electric or magnetic fields generated in one or more other parts of the system; or (c) with protecting or screening means to prevent radiation of undesired electric or magnetic fields generated within the system.

SEE OR SEARCH THIS CLASS, SUBCLASS:

800, for plural printed circuit boards with chassis or housing combined with shielding structure.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 32+ for miscellaneous anti-inductive structures, particularly indented subclasses 35+ for miscellaneous electrical shields and screen structures not elsewhere classifiable.

250, Radiant Energy, subclass 515.1 for radiant energy shielding means not elsewhere provided for.

307, Electrical Transmission or Interconnection Systems, subclass 91 for anti-induction or coupling to other systems with magnetic or electrostatic field control (e.g., shielding).

313, Electric Lamp and Discharge Devices, subclasses 326+ for electric lamp and discharge devices having electrode and shield structures.

315, Electric Lamp and Discharge Devices: Systems, subclass 85 for gaseous tube systems with electromagnetic wave radiation prevention or shielding means.

330, Amplifiers, subclass 68 for amplifiers with shielding means.

331, Oscillators, subclass 67 for oscillators combined with electromagnetic or electrostatic shield means.

333, Wave Transmission Lines and Networks, subclass 12 for transmission line inductive or radiation interference systems.

334, Tuners, subclass 85 for radio tuners with shielding means.

336, Inductor Devices, subclass 84 for induction devices with electric or magnetic shield means.

338, Electrical Resistors, subclass 64 for electrical resistors with electrical shield means.

343, Communications: Radio Wave Antennas, subclasses 841+ for antenna structure with electric shield means.

348, Television, subclass 842 for a video display with a light shield.

439, Electrical Connectors, subclass 497 for connector including tape cable with shield and subclasses 607+ for connector having or providing inductive or capacitive shield.

817 For electronic tube:

This subclass is indented under subclass 816. Subject matter wherein electric or magnetic field shielding or screening means is provided for a hermetically sealed glass or metal envelope in which conduction of electrons takes place through a vacuum or gas.

SEE OR SEARCH CLASS:

313, Electric Lamp and Discharge Devices, subclasses 326+ for electric lamp and discharge devices having electrode and shield structures.

315, Electric Lamp and Discharge Devices: Systems, subclass 85 for electric lamp and discharge devices systems having shielding means for part of the system.

818 EMI:

This subclass is indented under subclass 816. Subject matter wherein electronic systems and devices are provided with shielding or screening means to prevent a disturbance caused by electromagnetic waves that can impair the operation of electrical or electronic equipment.

(1) The terms “radio interference,” “radio-frequency interference,” “noise,” “emi,”

and "rfi" have been employed at various times in the same context.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 32+ for miscellaneous anti-inductive structures, particularly indented subclasses 35+ for miscellaneous electrical shields and screen structures not elsewhere classifiable.

819 For relay:

This subclass is indented under subclass 679. Subject matter comprising a support or housing for an electromechanical device in which contacts are opened or closed by variations in conditions of one electric circuit and thereby affect operation of other devices in the same or other electric circuits.

SEE OR SEARCH THIS CLASS, SUBCLASS:

142+, for relay control circuit including housing.

160+, for relay control circuits, per se.

SEE OR SEARCH CLASS:

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 2+ for relays, per se.

820 For semiconductor device:

This subclass is indented under subclass 679. Subject matter comprising a support or housing for at least an active solid state device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

717+, for active solid state devices using thermal conduction as a cooling means.

737, for IC cards in module with no cooling means.

764, for integrated circuit connected to printed circuit board with no cooling means.

783, for semiconductor device with mounting pad and having no cooling means.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 678+ for housing combined with semiconductor device wherein (a) the housing is for an active solid-state device, details of which are positively recited in the claims or (b) wherein the recited housing is necessary to make a usable active solid-state device.

821 For capacitor and inductor:

This subclass is indented under subclass 679. Subject matter comprising a support or housing for at least a device consisting essentially of two conducting surfaces separated by an insulating material or dielectric such as air, paper, mica, glass, plastic film, or oil, and at least one retardation coil.

SEE OR SEARCH THIS CLASS, SUBCLASS:

270, for transformers and inductor with capacitor element.

271+, for capacitor, per se.

738, for resistor and capacitor on printed circuit board with module.

763, for capacitor and electrical component on printed circuit board not in module.

766, for capacitor and electrical component coated on printed circuit board.

782, for passive component in conjunction with another electrical component on printed circuit board not in module.

814, for plurality of capacitors on a frame.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclass 260 for printed circuit with a capacitor or an inductor.

336, Inductor Devices, appropriate subclass for inductor, per se.

822 Contact banks:

This subclass is indented under subclass 600. Subject matter comprising arrays or groupings of electrical junction points.

(1) Note. The contacts are commonly used for switching devices, wire wrapping, etc. Diverse electrical components must be included for classification in this class (361).

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for plural conductors.
439, Electrical Connectors, appropriate subclass for connectors having plural contacts.

823 Terminal block:
This subclass is indented under subclass 600. Subject matter comprising an insulating base or slab equipped with one or more electrical connection points for the purpose of making electrical connections thereto.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for plural conductors.
439, Electrical Connectors, appropriate subclass for connectors having plural contacts.

824 With protective device or unit:
This subclass is indented under subclass 823. Subject matter wherein terminal blocks contain units or devices that safeguard against excessive voltage or current.

SEE OR SEARCH THIS CLASS, SUBCLASS:
630, for distribution or control panel boards with fuses.
646, for panel mounted fuses which are mounted in an electric service or distribution box.
833+, for fuse blocks of unit construction.

SEE OR SEARCH CLASS:
337, Electricity: Electrothermally or Thermally Actuated Switches, subclass 4 for fuse structure, per se.

825 Support brackets:
This subclass is indented under subclass 600. Subject matter comprising a fixture projecting from a wall or column used for supporting the electrical components or devices.

SEE OR SEARCH CLASS:
248, Supports, appropriate subclass for supports, per se.

826 Wire distribution (e.g., harness, rack):
This subclass is indented under subclass 600. Subject matter wherein the housings, mounting assemblies, or diverse electrical components are combined with wire apportion or distribution means.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, appropriate subclass for cable supports, cable supports having one electrical component or cable supports having plural same electrical component.

827 With interconnecting cable:
This subclass is indented under subclass 826. Subject matter wherein a conductive path between two or more terminals is an assembly of insulated conductors in a compact form covered by a flexible waterproof protective covering.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 102 for cable, per se.

828 With switchboard or switch:
This subclass is indented under subclass 826. Subject matter wherein the harness or rack supports a device for making, breaking, or changing connections in an electrical circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
605+, for electrical switchgear in power distribution systems and devices.
628+, for switches in distribution power boards.
832, for switchboard or switch in a frame.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, appropriate subclass for switches, per se.

829 Frame:
This subclass is indented under subclass 600. Subject matter wherein the electrical components are supported by skeletal-type beams forming an open frame or support.

SEE OR SEARCH CLASS:
248, Supports, appropriate subclass for supporting frames, per se.

830 With plurality of capacitors:
This subclass is indented under subclass 829. Subject matter wherein the frame supports two or more capacitors or condensers.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271+, for capacitors, per se.
738, for capacitor and resistor on printed circuit.
763, for capacitor and electrical component on printed circuit board not in module.
782, for passive component in conjunction with another electrical component on printed circuit board not in module.

SEE OR SEARCH CLASS:
174, Electricity: Conductors and Insulators, subclass 260 for printed circuit with a capacitor or an electrical component.

831 With cooling means:
This subclass is indented under subclass 829. Subject matter wherein the frame comprises a means for dissipating heat from the frame.

SEE OR SEARCH THIS CLASS, SUBCLASS:
676, for electrical power systems with cooling means.
688+, for electronic systems and devices with cooling means.

SEE OR SEARCH CLASS:
165, Heat Exchange, appropriate subclass for cooling means, per se.

832 With switchboard or switch:
This subclass is indented under subclass 829. Subject matter wherein the frame supports a device for making, breaking, or changing connections in an electrical circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
605+, for electrical switchgear in power distribution systems and devices.
628+, for switches in distribution power boards.
828, for switchboard or switches with wire distribution means.

SEE OR SEARCH CLASS:
200, Electricity: Circuit Makers and Breakers, appropriate subclass for switches, per se.

833 Fuse block:
This subclass is indented under subclass 600. Subject matter wherein an insulating base or slab houses a protective device, usually a short piece of wire but sometimes a chemical compound which melts and breaks a circuit when a current exceeds a rated value.

SEE OR SEARCH THIS CLASS, SUBCLASS:
630, for panel boards with fuses.
835, for fuses on pullout devices.

SEE OR SEARCH CLASS:
337, Electricity: Electrothermally or Thermally Actuated Switches, appropriate subclass for fuses, per se.
439, Electrical Connectors, appropriate subclass for fuse combined with connector arrangements.

834 Plural:
This subclass is indented under subclass 833. Subject matter wherein two or more fuse blocks are employed.

835 Fuse pullout device:
This subclass is indented under subclass 600. Subject matter comprising insertion and removal devices for mounting a current protective device or component in a housing.

SEE OR SEARCH THIS CLASS, SUBCLASS:
833+, for fuse blocks of unit construction.

836 For transformer:
This subclass is indented under subclass 600. Subject matter wherein the housing or mounting assembly is combined with an electrical device which changes voltage in direct proportion to a ratio of the number of turns of its primary and secondary windings.

(1) Note. The electrical housing or mounting assembly may also contain other electrical components.

SEE OR SEARCH THIS CLASS, SUBCLASS:

603, for power distribution station (substation) housings or mounting assemblies combined with transformer.

620, for electrical switchgear housing or mounting assembly with transformer.

623, for electrical power distribution systems housing and mounting assemblies with distribution or control unit combined with a transformer.

663, for electrical service meter housing or mounting assembly with transformer.

SEE OR SEARCH CLASS:

336, Inductor Devices, appropriate subclasses for transformers, per se.

837 For switch or fuse:

This subclass is indented under subclass 600. Subject matter wherein the housing or mounting assembly is combined with an electrical component or device and (a) a mechanical or electrical device that completes or breaks a path of current or sends current over a different path or (b) a protective device, usually a short piece of wire but sometimes a chemical compound, which melts and breaks a circuit when a current exceeds a rated value.

SEE OR SEARCH THIS CLASS, SUBCLASS:

605+, for electrical switchgear in power distribution systems and devices.

628+, for switches in distribution power boards.

630, for panel boards with fuses.

632, for switchboard or switch in a frame.

828, for switchboard or switches with wire distribution means.

833+, for fuse blocks of unit construction.

835, for fuses on pullout devices.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 52.1+ for boxes or housing containing a switch or fuse and having no structural details of a switch or fuse.

200, Electricity: Circuit Makers and Breakers, appropriate subclass for switches, per se.

337, Electricity: Electrothermally or Thermally Actuated Switches, appropriate subclass for fuses, per se.

FOREIGN ART COLLECTIONS

The definitions of the Foreign Patent/NPL Art Collections below correspond to the definitions of the abolished subclasses from which these Collections were formed. See the Foreign Patent/NPL Art Collection schedule for specific correspondences.

FOR 100 Overvoltage:

Foreign art collections including subject matter wherein the fault sensor is responsive to an overvoltage condition.

FOR 101 With specific current responsive fault sensor:

Foreign art collections including subject matter wherein the fault sensor responds to an abnormal current condition in the load circuit and subsequently activates a protective device.

END