CLASS 250, RADIANT ENERGY

SECTION I - CLASS DEFINITION

This is the residual class for methods and apparatus involving radiant energy.

SCOPE OF THE CLASS

This class provides for all methods and apparatus for using, generating, controlling or detecting radiant energy, combinations including such methods or apparatus, subcombinations of same and accessories therefore not classifiable elsewhere.

SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS

Many other classes provide for methods and apparatus involving radiant energy, per se, or in combination when such methods or apparatus are also the subject matter of the class in question.

In general, subject matter involving radiant energy is provided for in other classes on the basis of either a specific use of the radiant energy or a specific type of radiant energy. Classes explicitly providing for subject matter involving radiant energy are listed below and arranged according to the above described basis of classification followed by some miscellaneous classes.

CLASSES PROVIDING FOR SPECIFIC USES OF RADIANT ENERGY

See References to Other Classes for the following art areas:

Uses of Radiant Energy for Separating and Assorting

Uses of Radiant Energy for Treating

Uses of Radiant Energy As a Medium of Control

Uses of Radiant Energy for Testing

Uses of Radiant Energy As a Medium of Communication

CLASSES PROVIDING FOR SPECIFIC TYPES OF RADIANT ENERGY

Classes Providing for Electron Space Discharge Type of Radiant Energy

Visible Light Type

Other Wave Type

SECTION III - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclasses 103 and 444 for wave energy (see Uses of Radiant Energy for Treating).

15, Brushing, Scrubbing and General Cleaning, subclass 1.51 for electrostatic cleaning (see Uses of Radiant Energy for Treating).

19, Textiles: Fiber Preparation, subclass 0.21, for photoresponsive control of stopping (see Uses of Radiant Energy As a Medium of Control).

33, Geometrical Instruments, subclasses 227+ for light-ray type; subclasses 272+ for magnetic compasses; subclass 360, magnetic field responsive indicator of the direction of force traversing a natural media, using a CRT or photoelectric cell; and subclass 363, electrical telemetering with a photoelectric pickoff (see Uses of Radiant Energy for Testing).

33, Geometrical Instruments, subclass 363 for electrical telemetering with a photoelectric pickoff (see Uses of Radiant Energy As a Medium of Communication).

34, Drying and Gas or Vapor Contact With Solids, subclasses 245+ for processes and apparatus for drying or gas or vapor contact with solids in which the material or object treated is subjected to electromagnetic or electrostatic energy, including radiant electromagnetic energy; subclasses 266+ for treating feathers with radiant energy; and subclasses 524+ with automatic control (see Uses of Radiant Energy for Treating).

40, Card, Picture, or Sign Exhibiting, subclasses 542+ for luminous signs; subclasses 465+ for display with special effects having photoelectric switching control of electric circuit.

43, Fishing, Trapping, and Vermin Destroying, subclass 17.1 for electric current type and subclass 17.5 for luminous type; subclass 59 for condition responsive burglar traps.

49, Movable or Removable Closures, subclass 25 for radiant energy control, and subclasses 197+ for photocell control of an up-and-over, e.g.,

garage door, opener (see Uses of Radiant Energy As a Medium of Control).

60, Power Plants, subclass 202 for ion motors.

62, Refrigeration, subclass 3.1 for electrical or magnetic effect type; subclasses 139 and 140, automatic control by accumulation of ice or frost.

73, Measuring and Testing, subclass 23 for the analysis of gases; particularly; subclass 23.1 for the combination of a gas chromatography test and a radiation (invisible and visible) test, of the effluent from the test, subclasses 53.01+ for the examination of liquids or a liquid suspension of solids; particularly, subclass 61.4 for the visible light examination of the settling rate of a liquid suspension of solids, subclasses 73+ for moisture content or absorption characteristics generally, subclass 104 for surface or cutlery edge testing generally, and subclasses 151+ for bore hole and drilling study tests generally, subclasses 861+ for volume or rate of flow meters generally, and subclasses 290+ for liquid level or depth gauges including those using visible light (see Uses of Radiant Energy for Testing).

84, Music, subclass 639 and 724 for photocell controlled tone generators.

89, Ordnance, subclass 41.06 for operation of mount training mechanism motors by light reception (see Uses of Radiant Energy As a Medium of Control).

95, Gas Separation: Processes, subclasses 27 and 28 for processes of gas separation using magnetism and subclasses 57+ for processes of gas separation using an electric or electrostatic field (see Uses of Radiant Energy for Separating and Assorting).

96, Gas Separation: Apparatus, subclasses 1+ for magnetic separating means for gas separation and subclasses 15+ for electric or electrostatic field separation apparatus for gas separation (see Uses of Radiant Energy for Separating and Assorting).

99, Foods and Beverages: Apparatus, subclass 342, with signal, indicator or tester; subclasses 358 and 451 for apparatus for subjecting foods and beverages to wave, radiant and electrical energy (see Uses of Radiant Energy for Treating).

101, Printing, subclass 470 for copying for plate making using radiant energy.

112, Sewing, subclasses 80.23+ for embroidery with optical pattern program means (see Uses of Radiant Energy As a Medium of Control).

118, Coating Apparatus, subclass 691 for photoelectric sensors responsive to condition of coating material (see Uses of Radiant Energy As a Medium of Control).

118, Coating Apparatus, subclasses 620+ for coating apparatus combined with means to apply radiant energy to the work (see Uses of Radiant Energy for Treating).

131, Tobacco, subclasses 294 and 299 for radiant energy; and subclass 333 for smoke separating or treating (see Uses of Radiant Energy for Treating).

134, Cleaning and Liquid Contact With Solids, subclass 1.

134, Cleaning and Liquid Contact With Solids, subclass 1 for processes of cleaning or contacting of solids with liquids which includes the application of radiant energy, including radiant electric energy, to the work; and subclass 113, with alarm, signal, indicating, testing, inspecting, illuminating or display means (see Uses of Radiant Energy for Treating).

137, Fluid Handing, subclass 78.1, for condition responsive photocells; and subclass 93, for maintaining or sensing mixture condition by optical or chemical property in self-proportioning or correlating systems (see Uses of Radiant Energy As a Medium of Control).

141, Fluent Material Handling, With Receiver or Receiver Coacting Means, subclasses 192+, for automatic control of flow cutoff or diversion (see Uses of Radiant Energy As a Medium of Control).

156, Adhesive Bonding and Miscellaneous Chemical Manufacture, subclass 67 for methods of surface bonding and/or assembly therefor utilizing phosphorescent or fluorescent materials; subclass 244.17, surface bonding with lamina formation or coating by electric, magnetic or wave energy; subclasses 350+, automatic and/or material-triggered control, especially subclass 378, including testing, measuring or indicating means; and subclass 379.6 for apparatus with means applying wave energy to work (see Uses of Radiant Energy for Treating).

160, Flexible or Portable Closure, Partition, or Panel, subclass 5, for weather and/or light initiated automatic control (see Uses of Radiant Energy As a Medium of Control).

162, Paper Making and Fiber Liberation, subclasses 49 and 192 for processes using radiant energy; and subclass 263, measuring, testing, inspecting, indicating or illumination (see Uses of Radiant Energy for Treating).

164, Metal Founding, subclasses 147.1+ for electromagnetic means to apply force to work and subclasses 250.1+ for means to apply electrical or wave energy to work (see Uses of Radiant Energy for Treating).

166, Wells, subclass 336, with measuring, testing, inspection or condition determination; and subclass 247 for processes using nuclear energy or radioactivity for treating (see Uses of Radiant Energy for Treating).

166, Wells, subclasses 250+, for means to indicate, measure, test, or locate wells (see Uses of Radiant Energy As a Medium of Control).

175, Boring or Penetrating the Earth, subclass 41 for such subject matter combined with ray energy detection or measuring (see Uses of Radiant Energy for Testing).

178, Telegraphy, subclass 70, photocell repeaters (see Uses of Radiant Energy As a Medium of Communication).

192, Clutches and Power-Stop Control, subclass 129, for an electrical stop mechanism with photocell control; and subclass 142, radio tuner type limit stops (see Uses of Radiant Energy As a Medium of Control).

204, Chemistry: Electrical and Wave Energy, subclasses 155+ for the production of a compound or element by chemical reaction brought about by electrical or wave energy in a magnetic field, subclasses 157.15+ for processes of treating materials involving a chemical reaction brought about by wave energy, subclasses 164+ for production of an element or compound by chemical reaction in an electrostatic field or involving an electrical discharge, subclasses 450+ for electrophoresis or electroosmosis, subclasses 554+ for electrical or simultaneous electrical and magnetic separation or purification of a liquid or magnetic treatment of a liquid (other than separation), subclasses 194+ for electrolytic apparatus, subclasses 600+ for electrophoretic or electroosmotic apparatus, and subclasses 660+ for apparatus for electrical or simultaneous electrical and magnetic separation or purification of a liquid or magnetic treatment of a liquid (other than separation (see Uses of Radiant Energy for Separating and Assorting).

204, Chemistry: Electrical and Wave Energy, subclasses 155+, 157.15+ and 164+ for processes for preparing elements or compounds through chemical reactions brought about by the agency of wave energy, see this class (250) subclasses 492.1+ for corresponding apparatus (see Uses of Radiant Energy for Treating).

205, Electrolysis: Processes, Compositions Used Therein, and Methods of Preparing the Compositions, for electrolysis, in general (see Uses of Radiant Energy for Separating and Assorting).

208, Mineral Oils: Processes and Products, subclass 12 for coloring treatments including fluorescence (see Uses of Radiant Energy for Treating).

209, Classifying, Separating, and Assorting Solids, appropriate subclasses, especially 212 and 213+ for magnetic types and subclasses 511, 524, 536, and 576 for radiant energy type automatic assorting, subclasses 127.1+ for electrostatic type (see Uses of Radiant Energy for Separating and Assorting).

210, Liquid Purification or Separation, for methods and apparatus for the separation of a liquid from a liquid on a solid generally, particularly subclass 222 for the magnetic separation of particles from a liquid; and subclass 745, process control by optical sensing of condition (see Uses of Radiant Energy for Separating and Assorting).

219, Electric Heating, subclasses 6.5+ for induction; electrostatic or electromagnetic heating, subclasses 121.11 for electric arc metal heating; and subclasses 383+ for other electric arc type heating devices.

235, Registers, subclasses 454 through 473 for coded record sensors involving optical testing; and subclasses 400+, ordnance or weapons system computer (see Uses of Radiant Energy for Testing).

264, Plastic and Nonmetallic Article Shaping or Treating: Processes, subclass .5 for processes of shaping or treating radioactive material, subclasses 405+ for direct application of electrical or wave energy to work; and subclasses 408+, for processes of measuring, testing, or inspecting with sensing by utilizing light or passage of electric field current through material (see Uses of Radiant Energy for Treating).

219, Electric Heating, subclasses 121.6+, using laser with beam position control. (see Uses of Radiant Energy As a Medium of Control).

219, Electric Heating, various subclasses for infrared generators (see Classes Providing for Other Wave Type of Radiant Energy).

235, Registers, subclasses 400+, for ordnance or weapons systems computer, e.g., subclass 411, with target tracking means (see Uses of Radiant Energy As a Medium of Control).

242, Winding, Tensioning, or Guiding, subclasses 324+, especially subclass 331.4 for a photoelectric control for regulating winding or unwinding of magnetic tape or photographic film; subclasses 410+ for a photoelectric control for regulating tension in a running length of material; subclasses 534+ for a photoelectric control in a winding machine, and subclasses 563+ for a photoelectric control in an unwinding machine (see Uses of Radiant Energy As a Medium of Control).

244, Aeronautics and Astronautics, subclasses 3.1+, for missile stabilization or trajectory control utilizing radiant energy, especially subclasses 3.16+ (see Uses of Radiant Energy As a Medium of Control).

246, Railway Switches and Signals, subclasses 29+ for automatic block-signal systems utilizing radiant energy (see Uses of Radiant Energy As a Medium of Control).

252, Compositions, subclass 478 for X-ray neutron shield compositions; subclasses 625+ for radioactive compositions; and subclasses 301.16, 301.36, and 301.4, respectively, for luminescent compositions.

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 10, 11, 21, 53-56, 113-118, 184-189, 225-234, 257, 258, 290-294, and 414-466 for invisible radiation-sensitive active semiconductor devices. Class 257 limits itself to active solid state electronic device structures whereas Class 250, subclasses 370.01+ through 371 are limited to active semiconductor radiant energy detection systems. Some potential conflicts occur when an optical element is claimed. Where an optical element is recited as being integral with a semiconductive photodetector element, encapsulant housing or package, it will be classified in Class 257. Separate elements not part of the radiant energy detecting element or package and claimed therewith will be classified in Class 250, subclasses 370.01+ (see Classes Providing for Electron Space Discharge Type of Radiant Energy).

307, Electrical Transmission or Interconnection Systems, subclass 117 for radiant energy responsive switching systems (see Uses of Radiant Energy As a Medium of Control).

310, Electrical Generator or Motor Structure, subclass 301 for nuclear reaction types; and subclass 306 for thermal or pyromagnetic types.

318, Electricity: Motive Power Systems, subclasses 116+ for systems involving nonmagnetic motors.

322, Electricity: Single Generator Systems, subclass 2 for generating systems of the nonmagnetic type; subclass 26, automatic control with light or photoresponsive control circuits.

330, Amplifiers, especially subclasses 4+ for maser type amplifiers; subclass 42 for secondary electron emissive types; subclasses 44+ for electron beam types; subclasses 47+ for magnetically influenced discharge device types; and subclass 59, having light controlled or activated device.

331, Oscillators, especially subclasses 94+ for molecular or particle resonant types; and subclass 66, light responsive ambient condition sensor.

332, Modulators, subclasses 131+, 153+, 165+, 169+, 179+, employing electron discharge tube, especially subclass 132 for magnetron types, subclass 133 for klystron types.

333, Wave Transmission Lines and Networks, subclasses 175+ for resonant, discrete frequency selective type wave filters; and subclasses 219+ for resonators of the distributed parameter type.

313, Electric Lamp and Discharge Devices, appropriate subclasses, for electric space discharge devices, per se, including X-ray tubes, cathode-ray tubes, electric discharge lamps, liquid electrode discharge devices, gas or vapor filled discharge devices and vacuum tubes, and for the electrodes, filaments fluorescent targets and shields for electric space discharge devices; subclasses 523+, photosensitive discharge tubes; and subclasses 365+, image pickup cathode ray tubes (see Classes Providing for Electron Space Discharge Type of Radiant Energy).

314, Electric Lamp and Discharge Devices: Consumable Electrodes, subclass 22 for consumable electrode discharge devices which have means to feed a fluent, material, (e.g., solid particles) to the discharge space (see Classes Providing for Electron Space Discharge Type of Radiant Energy).

315, Electric Lamp and Discharge Devices: Systems, especially subclass 111.01 for systems wherein a fluent material is supplied to the discharge area between the discharge electrodes of the discharge device; subclass 134, readout energy responsive control of signal, indicator or alarm; and subclasses 149+, with radiant energy sensitive control means (see Classes

Providing for Electron Space Discharge Type of Radiant Energy).

324, Electricity: Measuring and Testing, for measuring or testing of electrical properties by the use of radiant energy; for measuring or testing of nonelectric properties (e.g., magnetic fields, subclasses 244+) by electrical means; and subclass 344, measuring and testing a geophysical surface or subsurface in situ with a radiant energy receiver (see Uses of Radiant Energy for Testing).

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 509+ for miscellaneous circuits responsive to external effects such as radiant energy (see Uses of Radiant Energy As a Medium of Control).

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems (see Classes Providing for Electron Space Discharge Type of Radiant Energy).

329, Demodulators, subclass 144, with light or heat beam deflection or modulation as a significant part of the detecting operation (see Uses of Radiant Energy As a Medium of Communication).

332, Modulators, subclass 3, a modulator combined with a photoelectric intelligence signal source (see Uses of Radiant Energy As a Medium of Communication).

333, Wave Transmission Lines and Networks, see Classes Providing for Other Wave Type of Radiant Energy.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, especially subclasses 210+, for electron or ion beam deflecting magnets, per se (see Uses of Radiant Energy As a Medium of Control).

338, Electrical Resistors, subclasses 13+ for such devices responsive to radiant energy (see Uses of Radiant Energy As a Medium of Control).

338, Electrical Resistors, subclass 15, light sensitive resistance (see Classes Providing for Electron Space Discharge Type of Radiant Energy).

340, Communications: Electrical, subclass 825.69 and 825.72 for radio control of an art device (see Uses of Radiant Energy As a Medium of Control).

340, Communications: Electrical, especially subclass 825.97 for electron beam selective types, subclasses 870.01+ for telemetering, especially subclass 870.29, with photoelectric pickup; subclass 942, photoelectric vehicle detectors; subclasses 555+, specific condition responsive indicating systems, especially subclasses 578, detecting flame by radiant energy, subclass 583, detecting ice formation by radiant energy [and] subclass 600, [for alarms] responsive to radiant energy, subclass 619, liquid level detection by radiant energy, and subclass 630, photoelectric smoke and other particle detectors (see Uses of Radiant Energy As a Medium of Communication).

341, Coded Data Generation or Conversion, subclasses 1+, digital pattern reading converter, especially subclasses 13, optical, and 14, optical waveguide, and subclass 31, photoelectric actuated keyboard code generator (see Uses of Radiant Energy As a Medium of Communication).

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 52+, combined with diverse type radiant energy systems, laser, TV, etc. (see Uses of Radiant Energy As a Medium of Communication).

345, Computer Graphics Processing and Selective Visual Display Systems, subclasses 180+ for light pen input to selective visual display communication systems (see Uses of Radiant Energy As a Medium of Communication).

346, Recorders, subclasses 107.1+ for light or beam recording of phenomenon information. See, also, subclass 33, combined with external optical system recorder operating means.

347, Incremental Printing of Symbolic Information, subclasses 129+ for electrostatic marking by photoscanning, subclasses 224+ for light or beam marking.

348, Television, subclasses 207.99 through 207.2 for television camera using a photocell, including subclasses 294-324 for solid-state image sensor and subclass 332 for array of photocells (see Uses of Radiant Energy As a Medium of Communication).

351, Optics: Eye Examining, Vision Testing and Correcting, subclass 210, using a photodetector to detect eye movement in an eye examining or test instrument (see Uses of Radiant Energy for Testing).

352, Optics: Motion Pictures, subclass 140, for focus control; and subclass 141, automatic diaphragm control (see Uses of Radiant Energy As a Medium of Control).

352, Optics: Motion Pictures, see Classes Providing for Visible Light Type of Radiant Energy.

353, Optics: Image Projectors, see Classes Providing for Visible Light Type of Radiant Energy.

355, Photocopying, see Classes Providing for Visible Light Type of Radiant Energy.

355, Photocopying, subclass 68, for illumination systems including photocells; subclasses 55+, for photodetector use with focus or magnification control; subclass 41, for identifying, composing or selecting using photocell; and subclass 38, for color film exposure or light intensity control (see Uses of Radiant Energy As a Medium of Control).

356, Optics: Measuring and Testing, see Classes Providing for Visible Light Type of Radiant Energy.

356, Optics: Measuring and Testing, for photocell methods and apparatus, subclass 71 for docu pattern analysis or verification; subclasses 364 for examination of materials using polarized light; subclasses 625 for measurement of material dimensions; subclasses 399 for determining lateral alignment; subclasses 402 for shade or color tests; subclasses 429 for monitoring of webs or threads; and subclasses 237.1 for the inspection for flaws or imper (see Uses of Radiant Energy for Treating).

358, Facsimile and Static Presentation Processing, subclasses 400 through 304 for facsimile (phototelegraphy) (see Uses of Radiant Energy As a Medium of Communication).

359, Optical: Systems and Elements, see Classes Providing for Visible Light Type of Radiant Energy, subclasses 507-514 for moisture or foreign particle control of optical elements or systems using photoelectric sensors (see Uses of Radiant Energy as a Medium of Control).

360, Dynamic Magnetic Information Storage or Retrieval, subclass 31, monitoring or testing the progress of recording, and subclass 74.6, photoelectric stopping or reversing control of a recorder (see Uses of Radiant Energy As a Medium of Communication).

361, Electricity: Electrical Systems and Devices, subclasses 225+ for particle charging, and subclasses 230+ for ionizing (see Uses of Radiant Energy for Treating).

361, Electricity: Electrical Systems and Devices, subclasses 173+ for photosensitive devices included in electromagnetic or relay control circuit (see Uses of Radiant Energy As a Medium of Control).

365, Static Information Storage and Retrieval, subclasses 106+, radiant energy; subclasses 215+, optical read/write circuits; and subclasses 234+, optical address (see Uses of Radiant Energy As a Medium of Communication).

367, Communication, Electrical: Acoustic Wave System and Devices, subclass 64, optical processing of land reflection type seismic prospecting (see Uses of Radiant Energy As a Medium of Communication).

369, Dynamic Information Storage or Retrieval, subclasses 44+, for optical transducers used in dynamic information storage and retrieval; and subclasses 100+, for radiation beam modification of, or by, storage medium (see Uses of Radiant Energy As a Medium of Communication).

368, Horology: Time Measuring Systems or Devices, subclass 11, for combinations with ambient condition detector (see Uses of Radiant Energy As a Medium of Control).

370, Multiplex Communications, subclasses 1+, optical multiplex communications (see Uses of Radiant Energy As a Medium of Communication).

372, Coherent Light Generators, subclasses 9+, for particular beam control devices (see Uses of Radiant Energy As a Medium of Control).

374, Thermal Measuring and Testing, subclass 32 for measuring the total thermal energy or power emitted from a radiating source; subclasses 121+ for determining temperature by measuring thermally emitted radiation; and subclass 162 for measuring temperature by a color change indicator (see Uses of Radiant Energy for Testing).

375, Pulse or Digital Communications, see Uses of Radiant Energy As a Medium of Communication.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclass 248, testing, sensing, measuring, or detecting a fission reactor condition using optics (see Uses of Radiant Energy for Testing).

376, Induced Nuclear Reactions: Processes, Systems, and Elements, appropriate subclasses for processes and apparatus for carrying out nuclear reactions particularly of the sustained or controlled type.

377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, subclass 53, systems with photoelectric detector; and subclass 6, counting of inanimate entities (see Uses of Radiant Energy for Testing).

378, X-Ray or Gamma Ray Systems or Devices, see Classes Providing for Other Wave Type of Radiant Energy.

378, X-Ray or Gamma Ray Systems or Devices, appropriate subclasses for testing and analyzing using X-ray or gamma rays; and subclasses 20, 68+, 177+, 195+, and 205+ for X-ray devices with object alignment or positioning means (see Uses of Radiant Energy for Testing).

378, X-Ray or Gamma Ray Systems or Devices, subclasses 64+ for X-ray or gamma ray irradiation devices (see Uses of Radiant Energy for Treating).

382, Image Analysis, all subclasses (see Uses of Radiant Energy for Testing and Uses of Radiant Energy as a Medium of Communication).

396, Photography, subclasses 549+ for phototype composing, subclasses 89+ for automatic camera focussing with photoelectric control; subclasses 213+ for automatic exposure control; and subclass 570 for photocell controlled fluid-treating means (see Uses of Radiant Energy As a Medium of Control).

398, Optical Communications, for light wave communication (using radiant energy as a medium of communication), particularly subclasses 106 through 114 for light wave remote control.

399, Electrophotography, subclasses 38+ for control of electrophotography processes (e.g., charging, exposure, developing, transfer, fixing, and cleaning (see Uses of Radiant Energy As a Medium of Control).

399, Electrophotography, subclasses 9+ for diagnostics of electrophotographic device and functions (see Uses of Radiant Energy for Testing).

362, Illumination, subclass 84 for a light source and luminescent material; subclasses 260 and 266 for luminescent light sources with light modifiers; and subclass 4, light responsive photographic lighting.

373, Industrial Electric Heating Furnaces, appropriate subclasses for arc and induction furnaces.

396, Photography, for apparatus for photochemically recording visible light.

399, Electrophotography, see Classes Providing for Visible Light Type of Radiant Energy.

409, Gear Cutting, Milling or Planing, subclass 128, for a tracer adapted to trigger a photocell (see Uses of Radiant Energy As a Medium of Control).

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 1+ for processes of disinfecting, deodorizing, preserving, or sterilizing non-foods by subjecting the same to electric or electromagnetic energy; subclasses 50+, analyzer, indicator or manipulative laboratory device; subclass 162, automatic analytical monitor and control of industrial products; subclass 85, with color change; subclass 91, gas analysis with adsorption with photometric detector; and subclass 106, control element responsive to sensed liquid level (see Uses of Radiant Energy for Treating).

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 1.11+ for methods of using a radionuclide containing compound or compositions, and for compositions comprising a radionuclide; and subclass subclasses 9.1+, for in vivo diagnosis and testing compositions and subclasses 10.1+, for Class 424 compositions with an identification or warning feature (see Uses of Radiant Energy for Treating).

426, Food or Edible Material: Processes, Compositions, and Product, subclasses 234, 236 and 237+ for processes involving the use of electrical, wave or radiant energy in food treatments (see Uses of Radiant Energy for Treating).

427, Coating Processes, subclass 10, optical measuring, testing and indicating; subclass 157, coating processes using a fluorescent or phosphorescent coating, and subclasses 457+ for processes of coating using electrical, magnetic, wave, or particulate energy (see Uses of Radiant Energy for Treating).

427, Coating Processes, subclasses 457+ for utilizing electrical or radiant energy and subclass 157 for phosphorescent coating.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, for pertinent subclass(es) as determined by schedule review.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, see Classes Providing for Other Wave Type of Radiant Energy.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, for processes of forming an image using all forms of radiation.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, see Classes Providing for Visible Light Type of Radiant Energy.

434, Education and Demonstration, subclasses 112+ for communication aids for the handicapped (see Uses of Radiant Energy As a Medium of Communication).

434, Education and Demonstration, subclasses 1+, electromagnetic energy sensor to detect or determine range of an object; subclasses 112+, communication aids for the handicapped; sub-

class 187, measurement of length or volume; subclass 240, radio navigation with light sensor in simulator; subclass 303, science, physics, optics; subclass 325, image projector, and light detector used in question or problem eliciting a response; subclass 337, correctness of response by means including light detector; subclasses 355 and 358, grading response involving light sensor (see Uses of Radiant Energy for Testing).

435, Chemistry: Molecular Biology and Microbiology, subclass 35 for test methods involving an enzyme (including reaction with a living cell, such as a bacterium) and a radioactive material; subclass 288.7, optical sensing apparatus (see Uses of Radiant Energy for Testing).

436, Chemistry: Analytical and Immunological Testing, subclasses 164+, for optical results of optical tests involving a reaction (see Uses of Radiant Energy for Testing).

438, Semiconductor Device Manufacturing: Process, particularly subclasses 473+ for gettering of a semiconductor substrate via irradiation, subclasses 514+ for ion implantation of electrically active dopants into semiconductive regions, and subclasses 795+ for thermal treatment of a semiconductor substrate via irradiation to modify some property thereof.

446, Amusement Devices: Toys, subclass 175, for such devices having light or sound responsive switch or control (see Uses of Radiant Energy As a Medium of Control).

455, Telecommunications, subclass 603 for light wave remote control (see Uses of Radiant Energy As a Medium of Control).

455, Telecommunications, see Uses of Radiant Energy As a Medium of Communication.

463, Amusement Devices: Games, subclasses 51+ for a game in which an electromagnetic ray (e.g., a light ray, etc.) is used to simulate a projectile fired from a gun, torpedo launcher, etc. (see Uses of Radiant Energy As a Medium of Control).

493, Manufacturing Container or Tube From Paper; or Other Manufacturing From a Sheet or Web, subclasses 3+, for condition responsive control means, especially, subclass 10, which uses a photocell condition sensor (see Uses of Radiant Energy As a Medium of Control).

505, Superconductor Technology: Apparatus, Material, Process, subclasses 150+ for high temperature (T_c greater than 30 K) superconducting devices, subclasses 300+ for processes of producing high temperature superconductor or superconductive devices, particularly subclasses 320, 325, and 480+ for use of radiant energy or particle bombardment; and cross-reference art collections 842+ for superconductor measuring and testing, or 848+ for radiant energy application on superconducting material (see Uses of Radiant Energy for Testing).

520, Synthetic Resins or Natural Rubbers, appropriate subclasses, particularly Class 523, subclass 136 for a composition containing a synthetic resin or natural rubber which is resistant to, yet does not absorb, radioactive materials or cathode rays or to processes of preparing said composition (see Classes Providing for Other Wave Type of Radiant Energy).

600, Surgery, subclasses 300+ for diagnostic testing (see Uses of Radiant Energy for Testing).

600, Surgery, subclasses 1+ for radioactive and substances (see Uses of Radiant Energy for Treating).

602, Surgery: Splint, Brace, or Bandage, subclass 2 for bandaging and orthopedics with light applications (see Uses of Radiant Energy for Treating).

604, Surgery, subclasses 20+, for infrared, visible, light, ultraviolet, X-ray or electrical energy applied to a body (see Uses of Radiant Energy for Treating).

607, Surgery: Light, Thermal, and Electrical Application, subclasses 1+ for light, thermal, thermal and electrical applications (see Uses of Radiant Energy for Treating).

702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclasses.

708, Electrical Computers: Arithmetic Processing and Calculating, subclass 816 for optical correlation or convolution.

901, Robots, subclass 47, for optical sensing devices (see Uses of Radiant Energy As a Medium of Control).

902, Electronic Funds Transfer, subclasses 41+, with means to read data stored on identifier (see Uses of Radiant Energy for Testing).

976, Nuclear Technology, an alternative search, search based on a modification of the European Patent Office Classification.

SECTION IV - GLOSSARY

CIRCUIT

A closed or closable conducting path through which, or along which, electric current can travel.

DETECTOR

A material or device whose response to radiant energy is used to indicate the presence or amount of incident radiation. Also, called "Signalling Means".

FLUENT MATERIAL

A liquid, gas or mass of granular solid material that does not of itself maintain its own spatial form but flows. Whether or not a granular material should be considered fluent or not is determined in each case by how it is handled. Generally if the handling means has walls to hold up the material, the material is fluent. Thus, for example, coal is necessarily fluent in a pail or bin but not necessarily fluent in a pile.

ION

An atom or molecule with at least one more or less electrons than protons. Electrons, per se, are not considered ions.

IONIZATION

The process of adding to or removing from an electrically neutral atom or molecule one or more of its electrons. Note: Ionization, as sometimes used to denote the process of increasing the energy level of an atom or molecule to some state short of the above, is not encompassed by this definition. Such processes in this class are considered partial or incomplete ionization.

INSPECTION

A term implying a source of radiant energy, and/or means to irradiate an object by said source and a detector responsive to radiation from the object to provide a signal representing some characteristic of the object.

OBJECT

A material subjected to radiation for treatment or whose response to or effect on the radiation is used to indicate something about the material.

PHOTOCELL

A detector used to sense light incident thereon and generate a signal representative of some aspect of the light such as intensity, phase, coherence, mode distribution, interference pattern characteristics, etc.

PHOTODETECTOR

See Photocell

PHOTOELECTRIC CELL

See Photocell

PHOTOSENSOR

See Photocell

RADIANT ENERGY

Energy propagated in the form of electromagnetic waves, or traveling subatomic, atomic or molecular particles.

RADIOACTIVE ACTIVE

Exhibiting spontaneous nuclear disintegration with emission of particulate or electromagnetic radiations.

SIGNALING MEANS, ELECTRIC AND NONELECTRIC

Detectors that produce in response to incident radiant energy either an increase or decrease in electric potential or current flow (Electric) or some other perceivable change (Nonelectric). The nonelectric change may be immediately perceived or may require development to be perceived, e.g., photographic changes.

SUBCLASSES

200 This subclass is indented under the class definition. Subject matter which includes a photocell.

(1) Note. DEFINITION OF TERMS: A photocell is defined for the purpose of classification in these subclasses as an electrical device which responds to light by varying its electrical characteristics or by generating an electric current. This definition therefore includes resistances, electric space discharge devices, batteries, inductances, condensers, bolometers and other electrical devices which have their electrical characteristics varied by radiant energy. For the purpose of classification in these subclasses "light" and "radiant energy" are used synonymously.

(2) Note. CIRCUITS AND APPARATUS INCLUDED: These are the generic subclasses for the following: a. Electrical circuits whose operations are controlled by means of a photocell. b. Electrical systems for supplying electric current and/or potential to a photocell. c. Photocells in combination with the optical means for controlling the radiant energy which illuminates the photocell. d. Photocells in combination with the source of illumination for the photocell. e. Apparatus which is limited to use with photocells and which is not otherwise classified. Examples of such apparatus are the photocell temperature control means in subclass 238 and the housings in subclass 239.

(3) Note. SIGNALING SYSTEMS: Electrical communication systems whose operation is controlled by means of a photocell are excluded from these subclasses. For such systems see the Search Class notes below.

(4) Note. PHOTOCELL CONTROLLED CATHODE-RAY TUBE CIRCUITS See the Search Class notes below for Photocell Controlled Cathode-ray Tube Circuits

(5) Note. PHOTOCELL COMBINED WITH DIVERSE TYPE DEVICE: These subclasses include a photocell apparatus or photocell controlled circuit when combined with a diverse type apparatus only when the combination includes only the portion of the diverse type apparatus necessary to provide for the photocell apparatus or circuit. Such combinations will be found for the most part in subclass 215 of this class. Where structure of the device is claimed in addition to that necessary to provide for the photocell apparatus or photocell circuit, the device is excluded from these subclasses and will be found with the art that provides for the particular device with which the photocell is combined. Also, see (6) Note below with reference to photocell circuits which are limited to controlling specific devices, such as a signal, meter, etc. See (3) Note above for a reference to signaling systems which include a photocell. For some of the classes which provide for devices which include a photocell apparatus or circuit, see the classes listed under (9) Note below.

(6) Note. PHOTOCELL CIRCUIT WITH SPECIFIC LOAD DEVICE IN THE OUTPUT CIRCUIT:

a. General Statement: These subclasses do not provide for photocell controlled circuits which have a particular load device, such as an electric motor, recited in the output circuit. Such systems are classified with the particular art. See the paragraphs below for some special exceptions to this general statement. For a partial list of the classes which provide for the excluded circuits, see the classes under (9) Note below.

b. Photocell controls its light source or optical system: These subclasses do provide in subclasses 201+ for photocell circuits where the output circuit controls means which control the optical system of the photocell, (e.g., rebalancing systems, apparatus having means for causing the photocell to move so as to trace the contour of a pattern, circuits having the illumination source for the photocell controlled by the photocell). Note that where the claims are limited to a photoelectric circuit having an electric lamp as the source of illumination for the photocell, the electric lamp being connected in the output circuit of the photocell circuit so that the lamp which illuminates the photocell is controlled by the photocell, no structure of the optical system between the lamp and photocell being claimed, the circuit is classified in Class 315, Electric Lamp and Discharge Devices: Systems, subclass 151.

c. Photocell with electronic tube or other current or potential modifying means in the output circuit. These subclasses do provide for photocell circuits having means in the output circuit for modifying or amplifying the photocell current or

voltage so as to produce the type of output control current or voltage desired. Examples of such means are the bridge circuits and electronic tube devices. Where the disclosure relates to a plurality of species of relay systems of which one is an electronic relay (electronic tube) system and the claims recite the relay in generic terms, classification is in Class 361, subclasses 173+. Where the claims are limited to an electronic relay or the disclosure relates only thereto even though the relay is recited broadly, classification is herein (Class 250).

If such optical system is claimed, the subject matter is classified in Class 250, subclasses 200+.

Where the device controlled in the output circuit is a cathode-ray tube, or where the photocell is a part of a cathode-ray tube and the claims do not include any significant output circuit for the cathode-ray tube, the circuit is classified in Class 315, Electric.

Lamp and Discharge Devices: Systems, subclasses 10+. See (4) Note above.

Where the device controlled in the output circuit is an electronic tube of the gas or vapor type (including gas or vapor discharge lamps), and the claims do not include any significant output circuit for the electronic tube, the circuit is classified in Class 315, Electric Lamp and Discharge Devices: Systems, subclasses 149+, especially in subclasses 156 and 157. Subclass 156 provides for the circuit where another electronic tube which is controlled by the photocell is interposed in the supply circuit of the gas or vapor type electronic tube, and subclass 157 where the electronic tube which is controlled is provided with a discharge control means (e.g., grid).

d. Photoelectric visible light examination apparatus.

The analysis of visible light by means of a photosensitive detector coupled to a recorder or meter is in Class 356. The analysis of light and including a photosensitive detector, but not including a meter, recorder or other indicator is classified in Class 250. The examination of solid, liquid or gaseous material or articles for an optical property, light scattering flaws, or size and configuration tests are in Class 356.

A support for material or an article being examined and a photosensitive device to detect variation in visible light caused by the examined material is classified in Class 356, providing the disclosure involves the examination of the material or the article by visible light.

The examination of material by visible light involving a photoelectric detection of the light as affected by the material and an electrical alarm is in Class 340, subclasses 619+.

(7) Note. PHOTOCELLS, PER SE: These subclasses do not include the structure of the photocell, per se. The photocells, per se, are classified according to the type of electrical device. For the classes and subclasses which provide for photocells and analogous devices, see the Search Class notes below.

(8) Note. TO COMPLETE THE SEARCH FOR THIS SUBJECT MATTER, see the Search This Class, Subclass and Search Class notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

336.1+, where the photocell has characteristics which cause it to respond principally to the invisible portion of the radiation spectrum or where the photocell is combined with means to insure that it will respond to the invisible portion of the radiation spectrum. Illustrative of such photocells are a Geiger-Mueller counter and a conventional photocell provided with an ultraviolet ray filter, respectively. Where the photocell will respond to both visible and invisible radiant energy and is not provided with means for enhancing response to

invisible radiant energy or diminishing response to visible radiant energy, classification is in subclasses 200+ (see (8) note above).

354.1, for photocell means to control the amount of invisible radiation falling on the photocell.

SEE OR SEARCH CLASS:

15, Brushing, Scrubbing, and General Cleaning, subclass 319, with automatic control.

19, Textiles: Fiber Preparation, photoresponsive control of stopping fiber preparation apparatus.

33, Geometrical Instruments, subclass 363, electrical telemetering with a photoelectric pickoff; subclass 707, distance, including optical. (see (9) note above).

40, Card, Picture, or Sign Exhibiting, subclasses 465+ for special effects displays with photoelectric switching.

49, Movable or Removable Closures, subclass 25, radiant energy control, and subclasses 197+, photocell control of an up-and-over closure opener.

60, Power Plants, subclasses 233+, condition responsive thrust bearing means for reaction motors; subclass 254, solid propellant type reaction motors including means to regulate or terminate motive fluid production.

62, Refrigeration, subclasses 139 and 140, automatic control by accumulation of ice or frost.

72, Metal Deforming, subclasses 6+ control means stimulated by condition responsive, including condition responsive sensor.

73, Measuring and Testing, subclasses 23, 23.1, 53+ including 61.4, 73+, 104, 151+, 861+, and 290 for measuring and testing involving, inter alia, radiant energy detection; subclass 705, photoelectric fluid projector gauge.

84, Music, subclasses 639 and 724 for musical instruments in which the sound is produced from electric currents which are generated or controlled by photocells or for the photocell subcombinations of such musical instruments, when restricted to such use.

89, Ordnance, subclass 41.06 for operation by photocell control of certain motors.

96, Gas Separation: Apparatus, subclasses 417+ for gas separation apparatus with signals, indicators, measuring, or testing means.

99, Foods and Beverages: Apparatus, subclass 342, with signal, indicator, or tester.

112, Sewing, subclasses 80.23+, for embroidery with optical pattern program means; subclasses 470.01+ for pattern control means.

118, Coating Apparatus, subclass 691, photoelectric sensor responsive to condition of coated material.

134, Cleaning and Liquid Contact With Solids, subclass 56, automatic controls, and subclass 113, with, inter alia, testing, inspecting or illuminating means.

136, Batteries: Thermoelectric and Photoelectric, subclasses 213+ for photocells of the radiation pyrometer type which generate electricity by virtue of the heating effect of radiant energy and which may contain optical means; subclasses 243+ for photocells of the primary battery type which depend upon the presence of visible radiant energy for their operation; and subclasses 291 for applications of these photocells (see Photocells, Per Se; (7) note above).

137, Fluid Handling, subclass 78.1, ambient condition responsive; subclass 93, sensing condition opically.

141, Fluent Material Handling With Receiver Coacting Means, subclasses 192+, automatic cutoff or diversion control.

160, Flexible or Portable Closure, Partition, or Panel, subclass 5 for closures, partitions or panels which are automatically controlled by a photocell.

162, Paper Making and Fiber Liberation, subclass 263, measuring, testing inspecting, indicating or illumination.

164, Metal Founding, subclass 4.1, with measuring, testing, inspecting or condition sensing.

166, Wells, subclasses 250+, with indicating, testing, measuring or locating.

175, Boring or Penetrating the Earth, subclass 41, combined with ray energy detection or measuring.

178, Telegraphy, subclass 70, photocell repeaters (see Signaling Systems; 3 Note above).

187, Elevator, Industrial Lift Truck, or Stationary Lift for Vehicle, subclass 317 for an electric control for an elevator door having a position detector mounted on the door and subclass 392 for an elevator with a position detector for monitoring passengers.

192, Clutches and Power-Stop Control, subclass 29, photocell control of stop; subclass 142, radio tuner stop control.

198, Conveyors: Power-Driven, subclasses 356+, with condition responsive control means, especially subclass 358, sensing condition of source or destination.

209, Classifying, Separating, and Assorting Solids, subclasses 509+, especially subclasses 576+, for devices containing a photocell, which will classify, separate or assort objects in accordance with their optical properties or their appearance, such as glossiness, color or size.

210, Liquid Purification or Separation, subclass 745, process control by optical sensing of condition.

219, Electric Heating, subclass 121.6 laser beam position control.

227, Elongated-Member-Driving Apparatus, subclasses 2+, with control means responsive to sensed condition.

235, Registers, subclasses 400+, ordnance or weapons computer, including subclass 411, with target tracking means; subclasses 375+, systems controlled by data bearing members.

241, Solid Material Comminution or Disintegration, subclasses 33+ with automatic control.

242, Winding, Tensioning, or Guiding, subclasses 331.4, 410+, 472.9+, 479.9+, 484.8, 484.9+, 534+, and 563+ for a detector or stop for regulating winding, unwinding, or tensioning of an elongated material.

244, Aeronautics and Astronautics, subclasses 3.1+, missile stabilization or trajectory control using radiant energy.

246, Railway Switches and Signals, subclass 29 for railway traffic control systems which are controlled by a photocell (see Signaling Systems; 3 Note above).

252, Compositions, subclass 501.1 contains photosensitive resistance compositions (see Photocells, per se; (7) note above).

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 10, 11, 21, 53-56, 113-118, 184-189, 225-234, 257, 258, 290-294, and 414-466 for radiation-sensitive active semiconductors devices (see Photocells, per se; (7) note above).

264, Plastic and Nonmetallic Article Shaping or Testing: Processes, subclasses 408+, measuring, testing or inspecting by passing light through material.

307, Electrical Transmission or Interconnection Systems, subclass 117, radiant energy responsive switching systems; subclass 10.8, vehicle mounted light system (see Signaling Systems; 3 Note above).

313, Electric Lamp and Discharge Devices, subclasses 364+ for photosensitive cathode-ray tubes, and subclasses 523+ for other photosensitive discharge devices (see Photocells, per se; (7) note above).

314, Electric Lamp and Discharge Devices: Consumable Electrodes, subclass 63 for arc lamps in which the feeding of the electrodes is controlled by a photocell.

315, Electric Lamp and Discharge Devices: Systems, subclasses 10+, with radiant energy sensitive control means, subclasses 82+ for vehicle headlamp as by dimming when the photocell is illuminated by the headlamps of another vehicle, and subclass 134, with signal indicator or alarm readout energy responsive control.

315, Electric Lamp and Discharge Devices: Systems, subclasses 10+ for miscellaneous circuits for supplying electric current and/or potential to a

cathode-ray tube where the system includes a photocell to control the cathode-ray tube. The systems included in subclasses 10+ include systems having a photocell in the supply circuit of the cathode-ray tube and systems where the cathode-ray tube includes a photoelectric electrode (see Photocell Controlled Cathode-ray Tube Circuit: (4) note above).

315, Electric Lamp and Discharge Devices: Systems, subclasses 10+ for photocell controlled cathode-ray tube circuits. See (4) and (6c) Notes, supra. Subclass 134 provides for indicator or alarm signal in an electron tube circuit controlled by a photoelectric cell. Subclasses 149+ provide for photocell circuits which control an electric lamp or an electronic tube of the gas or vapor type. See subclass 150 where the lamp or gas or vapor tube is itself a photocell, subclass 151 where the lamp which illuminates the photocell is in the output circuit of the photocell, (see (6) Note, b, above and subclasses 156 and 157 where the photocell controls the operation of a gas or vapor type electronic tube or lamp (see (6) Note, c, above).

318, Electricity: Motive Power Systems, subclasses 560+, particularly subclass 640 for electric motor position servo systems which may be responsive to a photocell; subclasses 576+, particularly subclass 577 for electric motor systems in which a photocell senses a pattern and controls the motor in accordance with the sensing; and subclass 480 for other photocell controlled electric motor systems.

322, Electricity: Single Generator Systems, subclass 26 for electric generator systems having a generator and a photocell which controls the generator or the driving means for the generator.

323, Electricity: Power Supply or Regulation Systems, subclass 221 for voltage magnitude control systems having a photocell which automatically controls the system.

324, Electricity: Measuring and Testing, subclass 344, using a radiant energy receiver for geological measurement or test; subclass 96, light detector.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 509+ for miscellaneous circuits responsive to radiant energy (see Signaling Systems; (3) note above.)

338, Electrical Resistors, subclasses 15+ for electrical resistors, per se, whose resistance value changes in response to a change in light intensity, e.g., photoconductive type electrical resistors (see Photocells, Per Se; (7) note above).

330, Amplifiers, subclass 59, light controlled or activated device.

331, Oscillators, subclass 66, light responsive ambient condition sensor.

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclasses 2+, electromagnetically actuated switches.

337, Electricity: Electrothermally or Thermally Actuated Switches, subclasses 298+ for thermally responsive switches (see Photocells, Per Se; (7) note above).

338, Electrical Resistors, subclasses 15+ for light responsive electrical resistors.

340, Communications: Electrical, subclasses 902+ for vehicle carried photocell system; subclasses 870.28+, for telemetering via light beam; subclasses 500+ for photocell controlled condition responsive devices; e.g., alarms; subclass 942, for photoelectric vehicle detectors.

340, Communications: Electrical, for miscellaneous signaling systems controlled by a photocell. Note especially subclasses 901+ for a vehicle carried photocell system, subclass 870.29 for telemetering via a light beam, and subclass 600 for a condition sensing photocell which actuates a signal or alarm (see Signaling Systems; (3) note above.)

341, Coded Data Generation or Conversion, subclasses 1+, digital pattern reading converter, especially sub-

classes 13, optical, and subclass 14, optical waveguide, and subclass 31, photoelectric actuated keyboard code generator (see Signaling Systems; (3) note above.)

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 52+, with diverse type radiant energy system.

345, Computer Graphics Processing and Selective Visual Display Systems, subclasses 180+ for light pen input to selective visual display communication systems.

346, Recorders, subclass 33, combined with external optical system recorder operating means.

348, Television, subclasses 207.99 through 207.2 and 332 for television system which may include a photocell (see Signaling Systems; (3) note above), and subclasses 602-603 for photocell controlled cathode-ray tube.

360, Dynamic Magnetic Information Storage or Retrieval, subclass 31 for monitoring or testing recording progress; subclass 74.6 for photoelectric stopping or reversing control; and subclasses 114.01-114.1 for reproducing only, using light.

351, Optics: Eye Examining, Vision Testing and Correcting, subclass 210, using photodetector to detect eye movement.

352, Optics: Motion Pictures, subclass 140, focus control; and subclass 141, automatic diaphragm control.

353, Optics: Image Projectors, subclasses 25+, selective data retrieval.

355, Photocopying, subclasses 55+, photodetector used with focus or magnification control; subclass 41, identifying, composing or selecting using photocell; subclass 38, color film exposure or light intensity control; subclasses 203+, photocopiers with diagnostic testing; subclass 68, illumination system including photocell.

356, Optics: Measuring and Testing , particularly subclasses 300+ for photoelectric spectroscopic apparatus, subclass 450 for photoelectric interference type test apparatus, subclasses 364+ for polarized light tests, subclasses 128+ for photoelectric refraction test apparatus, subclasses 402+ for shade or color tests, subclasses 433+ for light transmission tests, subclasses 445+ for light reflection tests, subclasses 218+ for photoelectric type photometers, and subclasses 237.1+ for photoelectric flaw testing apparatus.

358, Facsimile and Static Presentation Processing, subclass 161 for control of brightness or contrast of display on cathode-ray tube dependent on ambient light sensed by photocell, and subclasses 400-304 for facsimile and subclasses 471-498 for facsimile systems which may include a photocell (see Signaling Systems; (3) note above.) and for photocell control of a cathode-ray tube in facsimile systems (see Photocell Controlled cathode-ray Tube Circuit: (4) note above).

359, Optics: Systems (Including Communication) and Elements, subclasses 107 through 108 for optical computing, subclasses 507-514, for foreign particle control of optical elements or systems.

360, Dynamic Magnetic Information Storage or Retrieval, subclass 31 for monitoring or testing recording progress; subclass 74.6 for photoelectric stopping or reversing control; and subclasses 114.01-114.1 for reproducing only, using light.

361, Electricity: Electrical Systems and Devices, subclasses 173+ for photocell controlled relay and electromagnet circuits. See (6) Note. c, above.

362, Illumination, subclasses 276 and 277+ for illuminating means having a movable screen which is automatically controlled by a photocell, and subclass 4, light responsive photographic lighting.

363, Electric Power Conversion Systems, subclasses 125+ for rectifying systems having rectifiers of the selenium type, analogous to selenium photocells.

365, Static Information Storage and Retrieval, subclasses 106+, radiant energy; subclasses 215+, optical read-

write circuits; subclasses 234+, optical address (see Signaling Systems; (3) note above.)

367, Communications, Electrical: Acoustic Wave Systems and Devices, subclass 64, optical processing of seismic signals; subclasses 140+, signal transducer (see Signaling Systems; (3) note above.)

369, Dynamic Information Storage or Retrieval, subclasses 100+ for electrical sound recording and reproducing systems which include a photocell (see Signaling Systems; (3) note above.)

370, Multiplex Communications, subclasses 1+, optical (see Signaling Systems; (3) note above.)

379, Telephonic Communications, appropriate subclasses, for electric sound recording and reproducing, using photocells (see Signaling Systems; (3) note above.)

365, Static Information Storage and Retrieval, subclasses 106+, radiant energy; subclasses 215+, optical read-write circuits; subclasses 234+, optical address.

367, Communications, Electrical: Acoustic Wave Systems and Devices, subclass 64, optical processing of seismic signals; subclasses 140+, signal transducer.

368, Horology: Time Measuring Systems or Devices, subclass 11, ambient light sensor.

369, Dynamic Information Storage or Retrieval, subclasses 44+, optical transducers; subclasses 100+, radiation beam modification by storage medium.

370, Multiplex Communications, subclasses 1+, optical.

372, Coherent Light Generators, subclasses 9+, particular beam control device.

374, Thermal Measuring and Testing, subclasses 121+ for temperature measurement by an arrangement responsive to thermally emitted radiation by the body whose temperature it measured.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclass 248, testing reactor condition using optics.

377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, subclass 53, with photoelectric detector; subclass 6, counting inanimate entities.

378, X-Ray or Gamma Ray Systems or Devices, subclasses 97 and 108 for source control in response to detecting radiation therefrom.

382, Image Analysis, all subclasses.

396, Photography, subclasses 549+ for phototype composing, subclasses 89+ for automatic camera focussing with photoelectric control; subclasses 213+ for automatic exposure control; and subclass 570 for photocell controlled fluid-treating means.

400, Typewriting Machines, subclasses 706+, for indicating position of line or end of page, including detector of record medium.

409, Gear Cutting, Milling, or Planing, subclass 128, tracer adapted to trigger a photocell.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, subclasses 50+, analyzer, indicator or manipulative laboratory device; subclass 162, automatic analytical monitor and control of industrial products; subclass 85, with color change; subclass 91, gas analysis with absorption and with photometric detector; subclass 106, control element responsive to sensed liquid level.

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 9.1+ for in vivo diagnosis and testing compositions and subclasses 10.1+ for Class 424 compositions with an identification or warning feature.

427, Coating Processes, subclass 10, optical measuring, testing and indicating.

434, Education and Demonstration, subclasses 1+, electromagnetic sensor to detect or determine range; subclasses 112+, communication aids for handicapped; subclass 187, measurement of length or volume; subclass 240, radio

navigation with light sensor in simulator; subclass 303, science, physics, optics; subclass 325, image projector and light detector used in question or problem; subclass 337, correctness of response using light detector; subclasses 355 and 358, grading a response using light sensor.

435, Chemistry: Molecular Biology and Microbiology, subclass 288.7 for optical sensing apparatus; and subclasses 4+ for measuring or testing.

436, Chemistry: Analytical and Immunological Testing, subclasses 164+, optical result; subclass 805, optical property.

438, Semiconductor Device Manufacture: Process, particularly subclass 7 for methods of making semiconductor devices having a step controlled in response to a sensed optical condition and subclass 16 for methods having a step of measuring an optical condition.

446, Amusement Devices: Toys, subclass 175, having light or sound responsive switch or control.

455, Telecommunications, subclasses 600+, for lightwave communication (see Signaling Systems; (3) note above.)

463, Amusement Devices: Games, subclasses 51+ for a game in which an electromagnetic ray (e.g., a light ray, etc.) is used to simulate a projectile fired from a gun, torpedo launcher, etc., which game may include a photocell (often as part of a target for the gun, torpedo launcher, etc.

493, Manufacturing Container or Tube From Paper; or Other Manufacturing From a Sheet or Web, subclasses 3+, condition responsive control means, especially subclass 10, using photocell.

505, Superconductor Technology: Apparatus, Material, Process, subclasses 150+ for high temperature (T_c greater than 30 K) superconducting devices, subclasses 300+ for processes of producing high temperature superconductor or superconductive devices, particularly subclasses 320, 325, and 480+ for use of radiant energy or particle bombardment; and cross-reference art collections 842+ for superconductor measuring and testing.

600, Surgery, subclasses 300+ for diagnostic testing.

702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclasses.

703, Data Processing: Structural Design, Modeling, Simulation, and Emulation, subclass 3 for analog computer simulation of physical phenomena (see Signaling Systems; (3) note above).

708, Electrical Computers: Arithmetic Processing and Calculating, subclass 816 for optical correlation or convolution (see Signaling Systems; (3) note above).

901, Robots, subclass 47, optical sensing device.

902, Electronic Funds Transfer, subclass 41, with means to read data stored on identifier.

201.1 Photocell controls its own optical systems: This subclass is indented under subclass 200. Subject matter in which the photocell automatically controls the illumination which falls on the photocell by altering optical means located between a source of illumination and the photocell or by altering the illumination source.

(1) Note. The control of the illumination may be achieved by altering the source of light (e.g., intensity or position) or by altering the optical path between source of light and photocell (e.g., transparency of light transmitting medium or position of photocell or optics).

SEE OR SEARCH THIS CLASS, SUBCLASS:

205, for photocell controlled circuits for controlling light source intensity.

206.1+, for photocell controlled circuits or devices which do not control the illumination of the photocell.

216+, for optical systems which control the illumination of a photocell.

201.2 Automatic focus control:
This subclass is indented under subclass 201.1. Subject matter in which at least one photocell is used to automatically adjust a lens to form a distinct image of an object on an imaging surface.

SEE OR SEARCH CLASS:
396, Photography, subclasses 89+ for automatic camera focussing having photoelectric control.

201.3 Of a microscope:
This subclass is indented under subclass 201.2. Subject matter in which the focusing of the light image in a microscope is controlled.

SEE OR SEARCH CLASS:
359, Optics: Systems (Including Communication) and Elements, subclasses 368+, for optical microscopes, per se.

201.4 Active autofocus:
This subclass is indented under subclass 201.2. Subject matter having means to illuminate the object with light other than, or supplementary to, ambient light.

(1) Note. Optical elements or systems of optical elements, e.g., reflectors, used to concentrate or otherwise intensify ambient illumination are encompassed by active autofocus illumination means.

SEE OR SEARCH CLASS:
396, Photography, subclasses 106+ for automatic camera focussing using active ranging, for related subject matter when the camera structure is claimed as well as active focussing means.

201.5 With optical storage medium; e.g., optical disc, etc.:
This subclass is indented under subclass 201.4. Subject matter in which the image is formed on the surface of an optical information storage or retrieval medium, e.g., an optical disc.

SEE OR SEARCH CLASS:
369, Dynamic Information Storage or Retrieval, subclass 45 for patents claiming details of the optical storage medium or writing or reading of information to or from the medium, and subclasses 100+ for optical details of the optical information storage and retrieval system.

201.6 Based on triangulation:
This subclass is indented under subclass 201.2. Subject matter in which the focusing is based on geometric triangulation using a baseline distance between at least two photocells.

(1) Note. This subject matter differs from that in Class 356, subclasses 3.01+ in that subject matter in this subclass provides for triangulation to achieve automatic focus control of an optical pre-photocell system whereas subject, matter in Class 356, subclasses 3.01+ uses triangulation to measure the distance of an object from the photocell or pre-photocell system.

201.7 Based on contrast:
This subclass is indented under subclass 201.2. Subject matter in which the photo-cell generates signals used to create an image and adjustment of the focus is based on the degree of contrast in all or part of the image, i.e., on the ratio of the darkest and lightest portions of all or part of the image.

201.8 Based on image shift:
This subclass is indented under subclass 201.2. Subject matter in which the focusing is based on coincidence of two images of the same object moved in the same plane or of the displacement or distance between different images of the same object in the same plane, e.g., the photodetector plane.

201.9 Light beam wavefront phase adaptation:
This subclass is indented under subclass 201.1. Subject matter in which the phases of light waves are sensed and compared, and their sum or difference is used to control the optical system.

202 This subclass is indented under subclass 201.1. Subject matter having means for illuminating the photocell in accordance with the relative position of the photocell and a pattern, and having means for causing the photocell to follow the edge of the pattern under control of

said illumination, or for causing the optical path between pattern and photocell to change, under the control of said illumination, so that the photocell follows the edge of the pattern image.

(1) Note. The edge of the pattern may be either a thick or thin line or the line of demarcation between two areas of different optical properties. The photocell may follow the pattern either by moving spatially or by causing the pattern to move past the photocell while the photocell remains stationary.

SEE OR SEARCH THIS CLASS, SUBCLASS:

548, for optical systems including a web, strand, strip, or sheet and a photocell controlling same.

559.01+, for optical systems, including a web, strand, strip, or sheet and photocell circuit.

203.1 Following a target (e.g., a star or instrument pointer or other object) other than a pattern:

This subclass is indented under subclass 201.1. Subject matter having means for illuminating the photocell in accordance with the relative position of the photoelectric cell and an object, and having means for causing the photoelectric cell to follow the object under the control of said illumination.

(1) Note. The object may be a star, a search light at the end of a luminous glide path beam or a spot or an instrument.

(2) Note. The photocell must follow the object, as seen through the associated optical system. However, the photocell itself, or the supporting structure, as a whole, need not follow the point, as in a guided missile which is guided towards a terrestrial target by heavenly bodies sensed by a self-carried photocell guiding apparatus.

SEE OR SEARCH CLASS:

244, Aeronautics and Astronautics, subclass 3.16, for missile stabilization or trajectory control using optical guidance.

318, Electricity: Motive Power Systems, subclass 640 for electric motor follow-up systems wherein the motor control includes a photocell responsive to a moving light point.

346, Recorders, subclasses 31 and 32 for photocell systems which control a recorder in accordance with an instrument which operates, free of the mechanical burden, of the recorder, in which the pointer of the instrument is sensed and followed by the photocell, which controls the system which drives the recorder and following means.

382, Image Analysis, subclass 60, image sensing curve tracers for systems that follow the contour of a character as part of an optical character reader.

434, Education and Demonstration, subclass 4, optical radar included in a simulator; and subclass 240, light sensor included in simulator of radio navigation equipment.

463, Amusement Devices: Games, subclasses 51+ for a game in which an electromagnetic ray (e.g., a light ray, etc.) is used to stimulate a projectile fired from a gun, torpedo launcher, etc., which game may include a photocell (often as part of a target for the gun, torpedo launcher, etc.)

473, Amusement Devices: Games, subclasses 140+, 151+, 176, 192, and 199 for moving golf ball detection which may involve a photocell.

203.2 Target illuminated by artificial light source:

This subclass is indented under subclass 203.1. Subject matter in which the object to be tracked is, as disclosed, illuminated by an artificial light source, e.g., a laser, and the light from that source which is reflected from the target is detected and used to track the object.

203.3 Self-luminous target:

This subclass is indented under subclass 203.1. Subject matter in which the object to be tracked emits light which is detected and used to track the object.

203.4 Sun:
This subclass is indented under subclass 203.3. Subject matter wherein the self-luminous target to be tracked is the Sun.

(1) Note. Since solar radiation is so intense at or near the earth's surface. Many solar trackers track a shadow cast by an object in between the sun and the photocell.

SEE OR SEARCH CLASS:
126, Stoves and Furnaces, subclasses 573+, for solar heat collectors with tracking means controlled by sun position tracking sensor; and subclasses 600+ for means to reposition solar collector for optimum radiation exposure.

203.5 Cathode-ray tube scanning:
Subject matter under 203.3 in which the self luminous target followed is a spot of light on the face of a cathode-ray tube (CRT).

203.6 Airborne target, or spaceborne target other than the sun (e.g., star or missile):
This subclass is indented under subclass 203.3. Subject matter where the self-luminous target is a star or other spaceborne object other than the sun, e.g., a missile exhaust plume.

(1) Note. The brightness of these objects is substantially lower than that of the Sun.

203.7 With moving reticle in optical path:
This subclass is indented under subclass 203.3. Subject matter in which a moving, e.g., oscillating or rotating, apertured or patterned element is in the optical path between the target and photocell to modulate the light reaching the photocell from the target.

(1) Note. A reticle is often used (a) to chop the light reaching the photodetector(s) to permit a-c amplification of the signal generated by the photodetector(s); (b) to aid in distinguishing the target from background illumination; and (c) to generate signals indicative of the position (e.g., azimuth and elevation) of a target.

SEE OR SEARCH THIS CLASS, SUBCLASS:
233, rotary light chopping light valves for reticles used to control light reaching a photocell.

SEE OR SEARCH CLASS:
359, Optics: Systems (Including Communication) and Elements, subclasses 234+ for reticles which rotate in an optical path to control light.

204 This subclass is indented under subclass 201.1. Subject matter having two optical paths from a source or two sources of illumination to one or more photocells and having means for controlling one or more of the optical paths so that the ratio of light flux which traverses the different optical paths stays constant.

SEE OR SEARCH THIS CLASS, SUBCLASS:
208.1+, for similar subject matter having plural photocells in an electric circuit which does not control the illumination reaching the photocells.
578, for photocell illuminating systems having plural light paths to one or more photocells.

205 This subclass is indented under subclass 201.1. Subject matter having means for controlling the intensity of the light source which illuminates the photoelectric cell in accordance with the illumination which falls upon the photoelectric cell.

(1) Note. In addition to the means for controlling the light source, there may be means between the light source and the photoelectric cell to variably divert or absorb the light which passes from the light source to the photocell. Where the sole means for controlling the light which reaches the photoelectric cell is means to variably divert or absorb the light rays, the patent is not classified in this subclass, but will be found in subclasses 201.1 through 204 above.

(2) Note. The light source whose intensity may be controlled may be an electric

light, a gas flame or any other source of light.

SEE OR SEARCH THIS CLASS, SUBCLASS:
201.1, through 204, see (1) Note above.

SEE OR SEARCH CLASS:
315, Electric Lamp and Discharge Devices: Systems, subclass 151, where the source of illumination is an electric lamp or gas or vapor discharge device, the photocell controls the electrical condition or electrical characteristics of the source of illumination and there is no significant optical structure in the optical path between source of illumination and photocell.

206 This subclass is indented under subclass 200. Subject matter in which the photocell controls an electrical or electro-mechanical system circuit, and systems circuits under subclass 200 for supplying electric current and/or potential to a photocell.

(1) Note. In order to be classified in this and indented subclasses, the electrical or electro-mechanical system circuit should be significant. It is significant if it is recited in the claims more specifically than by name only, or if it is disclosed as being nonconventional.

206.1 This subclass is indented under subclass 206. Having means to generate positional information in at least one plane of a target moving relative to one or more photodetectors: Subject matter in which photodetecting means generate signals proportional to the position in at least one plane of a target moving relative to the photodetecting means.

(1) Note. In order to be classified in this and indented subclasses, the electrical or electromechanical system should be significant. It is significant if it is recited in the claims more specifically than by name only, or if it is disclosed as being nonconventional.

(2) Note. Subject matter in this subclass is differentiated from that in subclasses 203+ because in those subclasses, photocell output signals are used to control the pre-photocell optical system whereas in this subclass, no control of the pre-photocell optical system occurs or, if it does, is not claimed.

(3) Note. If a means for indicating the positional information is claimed, then classification is in Class 356, subclasses 139.04 through 139.08, 141.1 through 141.5 and 152.1 through 152.3.

(4) Note. The subject matter in this and indented subclasses is differentiated from that in subclasses 231.4+, in that, the latter subclasses deal with rotating shafts which are not considered to be moving targets since their location in global space is fixed even though they are rotating on an axis. Targets, on the other hand, are changing their global position regardless of whether they are spinning about an axis.

206.2 Detection of positional information in two more planes (e.g., azimuth and elevation; hour angle and declination):
This subclass is indented under subclass 206.1. Subject matter in which the positional information of a target moving relative to one or more photocells relates to two or more planes, e.g., azimuth and elevation, or hour angle and declination, and may be expressed in any coordinate system, e.g., Cartesian (X,Y,Z) or radial (r, theta).

206.3 With moving reticle in optical path:
This subclass is indented under subclass 206.2. Subject matter in which a moving, e.g., rotating or oscillating, apertured or patterned element is in the optical path between the target and photodetector(s) to modulate the light reaching the photodetector(s) from the target.

(1) Note. A reticle is often used (a) to chop the light reaching the photodetector(s) to permit amplification of the signal generated by the photodetector(s); (b) to aid in distinguishing the target from background illumination; and (c) to generate signals indicative of the position (e.g., azimuth and elevation) of a target.

SEE OR SEARCH THIS CLASS, SUBCLASS:

233, rotary light choppers to modify light reaching a photocell.

SEE OR SEARCH CLASS:

359, Optics: Systems (Including Communication) and Elements, subclasses 234+ for reticles which rotate in an optical path to control light.

207 This subclass is indented under subclass 206.1. Subject matter in which the photocell has plural electrodes, one or more of which is photoemissive, and in which secondary emission takes place.

(1) Note. Secondary emission is the emission of electrons from a material when bombarded by primary electrons. The secondary emission may take place at the photoelectric cathode or at one or plural other electrodes.

SEE OR SEARCH CLASS:

330, Amplifiers, subclass 42 for amplifiers having a secondary emissive tube.

208.1 Plural photosensitive image detecting element arrays:

This subclass is indented under subclass 206. Subject matter having plural photocells structured in the form of a one or two dimensional array capable of sensing an image of an object viewed by the array.

(1) Note. Subject matter in this subclass does not provide for means, e.g., electronic scanning means, coupled to the photosensitive image detecting array to generate a picture image.

(2) Note. Subject matter in this subclass includes arrangements of semiconductive photosensitive elements within an array which control an optical or electrical device and, therefore, do not fall within the scope of certain subclasses in Class 257 which are limited to arrays, per se.

(3) Note. If plural photocells are used to generate a picture image of an object viewed by the plural photocells, e.g., linear or area photocell arrays, the pictorial signal scanning and generation means will remove the subject matter from this class and subclass and take it to Class 348, subclasses 294+ and 332 and Class 358, Facsimile, subclasses 471+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

204, for photocell systems having plural optical paths which terminate at plural photosensitive electrodes and in which the optical paths are controlled by the photosensitive electrodes to balance the light flux in the plural paths.

207, for photocell systems in which the photocell has plural electrodes, some of which act as secondary emitters.

SEE OR SEARCH CLASS:

348, Television, subclasses 294+, for solid-state image sensor and subclass 332 for array of photocells for generating visible image of an object.

356, Optics: Measuring and Testing, subclass 222 for use of plural photocell photometers; subclass 343, using plural photocells to detect particle light scattering; subclass 411, for use of plural photocells to measure color of flowing liquids by light transmission; and subclass 435 for use of plural photocells to measure light transmission or absorption.

382, Image Analysis, subclass 68, full retina optical image sensing, for arrays of photocells that scan characters for recognition purposes.

208.2 Plural photosensitive nonimage detecting elements:

This subclass is indented under subclass 206. Subject matter having plural photocells structured or arranged so that they collectively do not detect or generate a picture image signal of an object from which light is detected by the photocells.

208.3 With electronic scanning:

This subclass is indented under subclass 208.2. Subject matter with means to electronically, as distinct from mechanically, scanning of the

photocell outputs to obtain an output signal or signals representative of the output signals of the plural photocells.

208.4 Used to switch an electrical circuit or device on or off:
This subclass is indented under subclass 208.2. Subject matter in which plural photocells are, by disclosure, used to generate signals which are used to switch all or just part of an electrical circuit on or off.

SEE OR SEARCH THIS CLASS, SUBCLASS:
214, for photocell controlled switching circuits, per se.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 500+ for condition responsive devices which are responsive to radiant energy and which use photocell controls to turn on alarms or other indicators in response to a specific condition sensed by the photocells.
361, Electricity: Electrical Systems and Devices, subclasses 174+ for condition responsive control systems for electromagnetic devices which use a light sensor for controlling its light path.

208.5 With photodetector output ratioing other than by bridge or push-pull circuits:
This subclass is indented under subclass 208.2. Subject matter in which circuit means are provided for forming a ratio of the outputs of two or more photodetectors other than by using bridge or push-pull circuits.

(1) Note. This subclass provides for many circuits which form ratios digitally rather than by older bridge or push-pull circuits. The latter are classified in Class 250, subclass 210.

SEE OR SEARCH THIS CLASS, SUBCLASS:
210, for circuits which form ratios by using bridge or push-pull circuits.

208.6 With specific relative positional geometry of photosensitive elements (e.g., an annular photosensitive element surrounding a coaxially mounted photosensitive element):
This subclass is indented under subclass 208.2. Subject matter in which the plural photosensitive elements are arranged in a predetermined, specific geometric orientation relative to each other to provide a desired result, e.g., detecting specularly reflected light as well as diffusely reflected light from an object viewed by the photosensitive elements.

SEE OR SEARCH THIS CLASS, SUBCLASS:
227.28, with specific light conductor or conductor component configuration, for related subject matter involving specific relative positional geometry of light conductors or components.

210 This subclass is indented under subclass 206.1. Subject matter in which the photocell is in a bridge circuit or in a push pull circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
209, for bridge circuits having plural photocells, plural photosensitive electrodes or plural nonphotosensitive electrodes.

214 This subclass is indented under subclass 206. Subject matter including means to electrically connect a particular photocell or electron tube with one or more electrical or electronic devices in a closed or closable electrically conducting path.

SEE OR SEARCH THIS CLASS, SUBCLASS:
315, Electric Lamp and Discharge Devices: Systems, subclasses 10+ for photocell circuits in which the photocell controls a cathode-ray tube or in which the photocell is part of a cathode-ray tube, and subclasses 149+ for photocell circuits in which the photocell controls a lamp or gas or vapor discharge device.

SEE OR SEARCH CLASS:
330, Amplifiers, appropriate subclasses, particularly subclass 59 for light controlled or light activated devices.

214.1 Special photocell:
This subclass is indented under subclass 214. Subject matter in which the photocell has characteristics which are sufficiently unique to be stated in the claims.

(1) Note. For a compilation of the classes which provide for photocells, per se, see (7) Note to subclass 200 of this class.

215 This subclass is indented under subclass 200. Subject matter in which the photocell is built into a device specific to an art other than the photocell art, and in which the utility of the art device is not destroyed by removal of the photocell.

(1) Note. As an example, a refrigerator which is provided with a photocell controlled defrosting device, in which the photocell senses excessive frost, is found in this subclass, if within the definition of superior subclass 200, since the photocell is (1) built into the refrigerator which (2) is an art device and which (3) has utility if the photoelectric cell is removed. Generally, the patents in this subclass are cross references, as there are few art devices which are not elsewhere provided for.

216 This subclass is indented under subclass 200. Subject matter having means for illuminating the photoelectric cell.

(1) Note. The means for illuminating the photoelectric cell should be significant, and if conventional and claimed by name only, is not found in this and indented subclasses.

(2) Note. The means for illuminating the photocell need not be a specific light source, but may be the ambient illumination.

221 This subclass is indented under subclass 216. Subject matter in which the optical path between the light source and the photocell is directly affected by an object which is movable with respect to, is not part of and is not continuously associated with the photocell device.

(1) Note. The ultimate object being sensed must directly affect the light beam, and not indirectly through the medium of a linkage, shutter or other instrumentality. Further, the object must be one which is independent of the photocell apparatus in the sense of being nonintegral with it and having an independent existence of its own, regardless of the existence of the photocell apparatus.

(2) Note. Examples of such objects are animate objects such as horses on a race track, human beings entering doors, animals in traps or inanimate objects such as plants being cultivated, work pieces being gauged, paint samples being tested.

SEE OR SEARCH THIS CLASS, SUBCLASS:
231, for similar subject matter where the article indirectly affects the photocell.
554, for similar subject matter where the article is a flame and illuminates the photocell.

222.1 Inanimate article:
This subclass is indented under subclass 221. Subject matter in which the object is an inanimate article.

222.2 Particle detection:
This subclass is indented under subclass 222.1. Subject matter in which the article is a particle.

SEE OR SEARCH CLASS:
377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, subclasses 10+ for particle counting.

223 This subclass is indented under subclass 222. Subject matter having means for carrying the inanimate article into or out of or through a location where the article will affect the optical path between the light source and the photocell.

(1) Note. The conveyor may stop while the article is being sensed.

(2) Note. Examples of conveyors are railroad cars on tracks and gravity operated chutes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

559.01+, and 566+, for similar subject where the object is a coded record or a web, strand, strip or sheet which is conveyed to the sensing point.

573, for similar subject matter, where the object is fluent or pulverulent and is conveyed to the sensing point.

224 This subclass is indented under subclass 222. Subject matter having means for causing relative movement between the inanimate article and the light ray while the article is in the light path between light source and photocell.

(1) Note. The motion referred to above is one above and beyond that required to bring the object into the testing or sensing station. During sensing, either the object, light source, photocell or some other part of the optical system may move.

(2) Note. As an illustrative example, this subclass includes camera shutter photocell sensing devices, where the camera shutter opens and closes while in the light beam and roller photocell sensing devices, where the roller is rotated while being sensed for size.

SEE OR SEARCH THIS CLASS, SUBCLASS:

223, for similar subject matter where the inanimate article is moved through the sensing station by a conveyor.

559.01+, and 566+, for similar subject where the object is a coded record or a web, strand, strip or sheet which is conveyed to the sensing point.

225 This subclass is indented under subclass 216. Subject matter having a polarizer in the optical path between light source and photocell.

SEE OR SEARCH CLASS:

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

226 This subclass is indented under subclass 216. Subject matter having optical means for acting unequally upon different frequencies of radiation in the optical path of light from a light source to the photocell.

(1) Note. Examples of such optical means, found in this subclass, are diffraction gratings, dispersion prisms and visible light filters.

SEE OR SEARCH THIS CLASS, SUBCLASS:

211, for similar subject matter, where the photocell has inherent selective color sensitivity.

239, for photocells which are provided with cooling means to absorb infrared rays.

361+, where the photocell is provided with means to enhance response to invisible radiant energy or diminish response to visible radiant energy, e.g., an ultraviolet filter.

227.11 Light conductor:

This subclass is indented under subclass 216. Subject matter including an optical fiber or rod, made of a material having a high index of refraction that allows it to confine, guide and transmit light.

SEE OR SEARCH CLASS:

385, Optical Waveguides, appropriate subclasses for light conducting elements, per se.

398, Optical Communications, particularly subclasses 134, 141, 178, 200, and 214 for light wave communications systems which employ optical waveguides optically coupled to photocells.

227.12 Optical delay line:

This subclass is indented under subclass 227.11. Subject matter where the light conductor is used to decrease the speed of a light pulse directed toward a photodetector.

(1) Note. Typically, light pulses are directed through a light conductor in which the speed of light is slower than through air or vacuum. The arrival of a pulse going through the light conductor is delayed from the time it would have arrived had it travelled directly through air or vacuum.

227.13 Light pen:
This subclass is indented under subclass 227.11. Subject matter wherein a photocell and light conductor are combined in a single instrument configured to be hand held.

SEE OR SEARCH CLASS:
235, Registers, subclasses 472.01+ for hand held optical coded record sensors.
345, Computer Graphics Processing and Selective Visual Display Systems, subclasses 180+ for visual displays employing light pens.
382, Image Analysis, subclass 59 for hand held image sensing means.

227.14 Condition responsive light guide (e.g., light guide is physically affected by parameter sensed which results in light conveyed to the photocell):
This subclass is indented under subclass 227.11. Subject matter in which the light which photocell senses is affected by some property of the light conductor itself which is, in turn, acted upon by the condition or parameter being sensed and the photocell generates an electric signal in response thereto.

(1) Note. The light conductor itself transduces a quantity or parameter which is sought to be measured quantitatively or qualitatively by the photodetector.

227.15 With detection of macroscopic break in fiber:
This subclass is indented under subclass 227.14. Subject matter wherein the detector and a light conducting fiber are positioned, configured or arranged so that light is coupled to or away from a detector if there is a break in the fiber to sense the presence of a break.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclasses 600+ for condition responsive devices which detect radiant energy.
356, Optics: Measuring and Testing, subclass 73 for testing of the optical properties of fiber optic light guides.

227.16 With detection of fiber microbend caused by parameter affecting fiber:
This subclass is indented under subclass 227.14. Subject matter in which a photodetector sense a small scale, i.e., micro, bend in an optical fiber caused by a parameter such as pressure, temperature, stress or strain, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:
231.1+, for photocell control of light valve pre-photocell systems which are activated by external physical quantities.

SEE OR SEARCH CLASS:
73, Measuring and Testing, subclass 705, photoelectric fluid pressure gauges; and subclass 800 for optical testing of specimen stress or strain.
356, Optics: Measuring and Testing, subclasses 32+ for optical measurement and testing of material strain.

227.17 Causing polarization change in fiber:
This subclass is indented under subclass 227.14. Subject matter in which the condition sensed changes the polarization of the light passing through the fiber due to some parameter affecting the fiber so that light of a different polarization reaches the photodetector than was incident on the fiber.

227.18 Causing light spectral frequency/wavelength change:
This subclass is indented under subclass 227.14. Subject matter in which the condition sensed causes a change in frequency/wavelength of the light transmitted to the photodetector by the light conductor.

(1) Note. The photocell may, for example, detect changes in the frequency of the light transmitted to it by the light conductor due to changes in the elongation of the light conductor.

(2) Note. This subclass provides for significant light conductor means in detecting color whereas subclass 226, is directed to color detection broadly.

SEE OR SEARCH THIS CLASS, SUBCLASS:

226, color (e.g., filter or spectroscope), for related subject matter that may or may not include light conductors.

SEE OR SEARCH CLASS:

209, Classifying, Separating, and Assorting Solids, subclasses 580+, for sorting articles based on their color.

356, Optics: Measuring and Testing, subclasses 402+, measuring and testing color of an object; subclasses 300+ for measuring and testing by dispersed light spectroscopy.

436, Chemistry: Analytical and Immunological Testing, subclasses 164+ optical result, including subclass 171, optical spectrum, where the test and the result involves a chemical reaction.

702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclasses.

227.19 With coherent interferrometric light:

This subclass is indented under subclass 227.14. Subject matter wherein the light waves transmitted by the light conductor are coherent, i.e., the phases of the waves are substantially in step spatially and temporally, and the condition sensed by the light conductor affects the coherent light so that an interferometric pattern is presented to the photocell.

(1) Note. This definition is inclusive and includes, for example, arrangements where noninterferometric light is presented to a photocell along with an interferometric pattern to a photocell.

(2) Note. This type of device ordinarily includes fiber-optic equivalents of classic interferometers, e.g., Michelson interferometers, and ring laser gyroscopes. It also includes detection of changes in the state of polarization in a light conductor, e.g., induced birefringence by stresses or strains.

(3) Note. This is a residual subclass in a residual class and other classes and subclasses, e.g., Class 356, subclasses 32+ or 345+, provide for this subject matter where optical measurement and testing are involved, and take precedence. Cross-references to this subclass (277.19) are discretionary.

SEE OR SEARCH THIS CLASS, SUBCLASS:

550, interference pattern analysis for related subject matter which may or may not involve light conductors but which does not claim significant light conductor means.

SEE OR SEARCH CLASS:

356, Optics: Measuring and Testing , subclass 450 for measuring and testing by light interference involving, inter alia, coherent interferometric light.

359, Optics: Systems (Including Communication) and Elements, subclasses 1+ provide for holographic systems which employ coherent interferometric light.

365, Static Information Storage and Retrieval, subclasses 215+ for optical, including holographic, read/write circuits which may include light conductors handling interferometric light.

227.2 With imaging:

This subclass is indented under subclass 227.11. Subject matter wherein the light conductor presents an image of the object viewed by it to the photocell, outputting the elements of the object(s) that it views in the same spatial relationship they have in reality.

(1) Note. An imaging light conductor is defined as one which presents an image of the object viewed by it to the photocell(s). An imaging light conductor outputs the elements of the object(s) it views in the same spatial relationship they have in reality. An incoherent light conductor is one which scrambles the object it views so that what is transmitted to the photocell(s) is not an image of

the original, but is light reflected by or transmitted through the object in a non-image form. A coherent light conductor can present a true image of an object it views to a photocell with ordinary incoherent light reflected from or transmitted through the object.

SEE OR SEARCH CLASS:

385, Optical Waveguides, subclasses 116+ and 133, for imaging light conducting guides/fiber bundles, per se.

227.21 With light chopping or modulation:

This subclass is indented under subclass 227.11. Subject matter wherein means are provided for varying the intensity of the light transmitted to the photocell from substantially zero to substantially maximum intensity as a function of time.

(1) Note. The chopping or modulating means may be for example, electromechanical or electrooptical, an object under inspection or analysis, or a keyboard controlled optical shutter, for example.

SEE OR SEARCH CLASS:

359, Optics: Systems (Including Communication) and Elements, appropriate subclasses for light modulators/chopping devices, per se, as well as for optical logic devices.

227.22 Keyboard or other manual switch controlled:

This subclass is indented under subclass 227.21. Subject matter in which the means to operate the light gate or modulator is a manually operable switch or keyboard.

SEE OR SEARCH THIS CLASS, SUBCLASS:

229, for light chopping or modulation type pre-photocell optical systems.

SEE OR SEARCH CLASS:

341, Coded Data Generation or Conversion, subclass 31 for photocell controlled keyboard coders which include code conversion data processing.

227.23 With spectral frequency/wavelength discrimination:

This subclass is indented under subclass 227.11. Subject matter including means for selecting and transmitting light of one or more discrete wavelengths or wavelength bands by the light conductor(s) to the photocell(s).

(1) Note. The intensity of the light of different wavelengths may be varied by using, for example, polarizers, diaphragms, etc.

(2) Note. This subclass provides for significant light conductor means in detecting color, whereas subclass 226 is directed to color detection broadly.

SEE OR SEARCH THIS CLASS, SUBCLASS:

226, color (e.g., filter or spectroscope), for related subject matter that may or may not include light conductors,

SEE OR SEARCH CLASS:

209, Classifying, Separating, and Assorting Solids, subclasses 580+ for sorting articles based on their color.

356, Optics: Measuring and Testing , subclasses 402+ measuring and testing colors of an object, subclasses 300+ for measuring and testing by dispersed light spectroscopy; and subclass 451 measuring and testing by interferometric spectroscopy.

436, Chemistry: Analytical and Immunological Testing, subclasses 164+, optical result, including subclass 171, optical spectrum, where the test and the result involves a chemical reaction.

702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclasses.

227.24 With coupling enhancement means:

This subclass is indented under subclass 227.11. Subject matter with means used to increase the overall coupling efficiency of the light conductor and the photocell, i.e., to improve the ratio of light reaching the photocell from the light conductor to the light leaving the photoconductor on its way to the photocell.

(1) Note. Coupling enhancement means may or may not include structure to physically or mechanically connect a photocell to a light conductor. The enhancement means may, for example, simply include configurations to improve evanescent wave coupling phenomena, or modal coupling phenomena, or may include optomechanical connectors.

(2) Note. A light conductor coupled to a photocell may be classified here or in Class 356, subclasses 96+, depending on what is recited. If the photocell is just nominally recited, and the coupling enhancement means is recited nominally or in detail, then classification is proper in Class 385. If the photocell is recited more than nominally, i.e., including an electrical output which is generated for utilization, then classification is in this subclass regardless of the claimed detail of the coupling enhancement means.

SEE OR SEARCH CLASS:

385, Optical Waveguides, subclasses 15+ for optical coupling means, per se. See Note (2), above.

227.25 Fluid coupling:

This subclass is indented under subclass 227.24. Subject matter in which the coupling enhancement means is a fluid, i.e., in the gas or liquid state.

227.26 With scanning:

This subclass is indented under subclass 227.11. Subject matter with means to actually or electronically move a light beam transmitted by a light conductor over an object.

(1) Note. The scanning may involve a stationary light conductor and moving optical elements such as lenses or reflectors, or may involve moving the light conductor. It also may include electronic scanning of the photocells optically coupled to the light conductors.

SEE OR SEARCH CLASS:

348, Television, subclasses 197 and 359 for television scanners employing fiber optics.

359, Optics: Systems (Including Communication) and Elements, subclasses 196+, 227+, 240+, 290+, and 298+ for various optical scanning means.

227.27 With coherent interferrometric light:

This subclass is indented under subclass 227.11. Subject matter wherein the light waves transmitted by the light conductor are coherent, i.e., the phases of the waves are substantially in step spatially and temporarily, and the condition being sensed by the light conductor affects the coherent light to present an interferometric pattern to the photocell.

(1) Note. This definition is inclusive and includes arrangements where noninterferometric light is presented to a photocell along with presentation of an interferometric pattern to a photocell.

(2) Note. This type of device ordinarily includes use of light conductors which transmit light with a spatial energy distribution which is characterized as a single transverse electromagnetic mode (TEM) distribution. Included are not only single interferometric devices, but optically coupled (by light conductors) multiple interferometric devices.

SEE OR SEARCH THIS CLASS, SUBCLASS:

550, interference pattern analysis for related subject matter which may or may not involve light conductors but which does not claim significant light conductor means.

SEE OR SEARCH CLASS:

356, Optics: Measuring and Testing , subclass 450 for measuring and testing by light interference involving, inter alia, coherent interferometric light.

365, Static Information Storage and Retrieval, subclasses 215+ for optical, including holographic, read\write circuits which may include light conductors handling interferometric light.

227.28 With specific configuration of light conductor components with respect to each other:
This subclass is indented under subclass 227.11. Subject matter in which the components of a light conductor have a specific, predetermined configuration with respect to each other to achieve a desired light beam pattern to be presented to the photodetector means, e.g., one with suppressed higher order transverse electromagnetic (TEM) modes.

SEE OR SEARCH CLASS:
385, Optical Waveguides, appropriate subclasses for optical fibers with specific components, per se.

227.29 With specific illumination or viewing orientation of light conductor relative to viewed object (e.g., light normal to, and detector at 45 degree angle to, viewed object):
This subclass is indented under subclass 227.11. Subject matter in which the angular relationship of the light source, photodetector means and object being illuminated and detected have a specified geometric relationship.

(1) Note. For example, the photodetector may be placed at 45 degrees to the normal of the illuminated surface, while the optical axis of the light source may be placed perpendicular to the object surface.

227.3 With variable orientation of light conductor relative to viewed object (e.g., goniometer):
This subclass is indented under subclass 227.11. Subject matter in which means are provided to vary the angular relationship of the light source or photodetector with respect to the surface of the object under illumination and photodetection.

(1) Note. Devices with means to vary the angular relationship between light source, object surface and photodetector are conventionally known as goniometers.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 340, measuring particle light scattering with photocell detection at variable angle to the light beam.

227.31 Side or edge illuminated light conductor or collector:
This subclass is indented under subclass 227.11. Subject matter in which the light conductor is configured or arranged to receive light along its side or edge in lieu of, or in addition to, its end face.

(1) Note. Typical examples include solar collector light collecting guides and optical scanning light conductors.

227.32 End illuminated light conductor with noncircular geometric cross section:
This subclass is indented under subclass 227.11. Subject matter wherein the light conductor has a noncircular end-face configuration which is end-face illuminated.

(1) Note. The light conductors in this subclass are end-face illuminated whereas in the previous subclass they are illuminated along their side or edge faces. Both subclasses encompass light conductors of various geometries other than cylindrical or circular.

228 This subclass is indented under subclass 216. Subject matter having an integrating sphere in the optical path between light source and photocell.

(1) Note. An integrating sphere is a hollow body having an interior of highly light reflecting but also diffusing material, and having relatively small openings in the shell of the hollow body to admit light. It has the property of raising the interior illumination to a level which depends only upon the amount of light flux entering the openings and not upon the reflection or diffusion of that incident light flux.

229 This subclass is indented under subclass 216. Subject matter having means in the optical path between light source and photocell for varying

the amount of light which reaches the photocell.

(1) Note. In this subclass, the means for varying the amount of light which reaches the photocell is always a part of, or is continuously associated with, the photocell device, and is not an object which has an independent existence of its own. Devices found in this and indented subclass comprises, for example, keyboard operated shutters which variably permit a light source to illuminate a photocell, iris diaphragms and optical wedges.

SEE OR SEARCH THIS CLASS, SUBCLASS:

221+, for similar subject matter in which the light path between light source and photocell is directly affected by an object which is not part of the photocell apparatus and has an independent existence of its own.

237, for similar subject matter comprising relatively stationary hoods, gratings, baffles or diaphragms.

230 This subclass is indented under subclass 229. Subject matter in which the optical path between light source and photoelectric cell includes a reflective element, and in which the amount of reflection or the direction of reflection is varied so as to vary the intensity of the photocell illumination.

(1) Note. Examples of such variable reflecting elements include mirrors which oscillate under the control of a physical quantity and compass cards which have variable reflective markings.

231.1 Actuated by dynamic external physical quantity:

This subclass is indented under subclass 229. Subject matter in which the means in the optical path between the light source and the photocell for varying the amount of light which reaches the photocell is actuated by an external mechanical force.

(1) Note. Examples of dynamic type physical quantities include pressure, weight (mg where m = mass of an object andg = gravitational force), force (f) where f = ma or f = 1/2 mv squared), deflection of an object connected to the means in the optical path for varying the amount of light reaching the photocell, speed of an object, velocity of an object (including fluid flow), position (angular or linear) of an object.

(2) Note. Measurement of the position of an object properly classified herein is distinct from the position indication classified in this class, subclasses 206.1+ in that the latter concerns global position of a target whereas this subclass concerns local position, e.g., rotation of a shaft about an axis where the shaft's global position is known or not of concern.

(3) Note. Excluded from the definition of dynamic type physical quantities are electrical quantities, e.g., current, voltage, impedance; chemical properties; passive physical quantities and forces, such as color, temperature, physical dimensions (length, width, diameter, Coriolis force); and quantum mechanical forces and properties.

SEE OR SEARCH CLASS:

33, Geometrical Instruments, subclass 363, for electrical telemetering with a photoelectric pickoff; and subclass 707 for distance measuring including optical means.

73, Measuring and Testing, subclass 290 for measuring and testing involving, inter alia, radiant energy detection; and subclass 705 for photoelectric fluid projection gauges.

324, Electricity: Measuring and Testing, subclasses 96+ for measurement, testing or sensing of electricity using radiant energy; and subclass 344, for use of a radiant energy receiver for a geological measurement or test.

356, Optics: Measuring and Testing , for measurement of passive physical forces such as color (subclasses 402+); temperature (subclasses 43+), and physical dimensions (subclasses 2, 3+, 27+, 450, 123, 124+, 372+, 388+, 247+, etc.)

374, Thermal Measuring and Testing, subclasses 32, 121+, and 162 for various temperature measuring means or methods.

396, Photography, subclasses 106+ for automatic camera focussing using active ranging.

434, Education and Demonstration, subclasses 1+ for electromagnetic sensors to detect or determine the range of an object; subclass 187 for measurement of length or volume; and subclass 303, for science, physics or optics.

435, Chemistry: Molecular Biology and Microbiology, subclass 808 for optical sensing apparatus.

436, Chemistry: Analytical and Immunological Testing, subclasses 164+ for analytical chemical testing by optical means and involving a chemical reaction.

702, Data Processing: Measuring, Calibrating, or Testing, appropriate subclasses.

231.11 Actuated by gauge element deflection:
This subclass is indented under subclass 231.1. Subject matter wherein displacement of a gauge component, e.g., needle, by a force, e.g., gravity or an electromotive force is the active external physical quantity sensed.

231.12 Gyroscopes:
This subclass is indented under subclass 231.1. Subject matter wherein gyroscopic movements or conditions are the active external physical quantities sensed.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, subclass 5.6, for gyroscopes with optical pickoffs.

231.13 Shaft angle transducers:
This subclass is indented under subclass 231.1. Subject matter wherein the angular position or speed or a rotatable shaft is the active external physical quantity sensed by one or more photocells and an output is generated which is indicative of those parameters.

SEE OR SEARCH CLASS:

341, Coded Data Generation or Conversion, subclasses 1+ for related subject matter further specifying the coded data generation or conversion circuitry, especially subclasses 13+ and 31 for optical type code converters, including keyboard actuation.

231.14 Incremental shaft readers; i.e., with means to generate increments of angular shaft rotation:
This subclass is indented under subclass 231.13. Subject matter wherein photocell means is provided to incrementally sense the angular position or speed of a rotatable shaft as the active external physical quantity and for generating an output proportional to the number of increments sensed by the photocell(s).

SEE OR SEARCH CLASS:

341, Coded Data Generation or Conversion, subclass 11 for similar subject matter combined with digital signal processing circuitry.

231.15 With plural gear driven discs:
This subclass is indented under subclass 231.14. Subject matter in which the incremental data is generated using more than one circularly shaped element coupled to the rotating shaft by gear drive means.

SEE OR SEARCH CLASS:

341, Coded Data Generation or Conversion, subclass 2 for similar subject matter combined with digital signal processing circuitry.

231.16 Using phase difference of output signals from plural photodetectors:
This subclass is indented under subclass 231.14. Subject matter in which a signal proportional to the phase sum of, or difference between, outputs of the photodetectors is generated and is representative of the angular position or speed of the rotating shaft.

SEE OR SEARCH CLASS:

341, Coded Data Generation or Conversion, subclass 6 for similar subject matter combined with digital data processing circuitry.

231.17 With means to indicate a complete shaft rotation:
This subclass is indented under subclass 231.14. Subject matter in which means are provided to determine whether a complete revolution of the shaft has occurred and to generate a signal representative of that fact.

(1) Note. The provision of means to determine the number of complete revolutions is also included in this subclass.

231.18 Position indicating shaft encoders with means to generate a unique signal for each specific angular shaft position:
This subclass is indented under subclass 231.14. Subject matter including means to establish a unique number of shaft angle positions and to generate a unique, distinct signal for each of those positions.

SEE OR SEARCH CLASS:
341, Coded Data Generation or Conversion, subclass 13 for similar subject matter combined with digital signal processing circuitry.

231.19 Pressure-responsive light valves:
Subject matter under 231.1 wherein the dynamic external mechanical force sensed is pressure ((P) = F/A where F = a Newtonian type force and A = Area over which the force is applied) applied to the means in the optical path for varying the amount of light to reach the photocell(s).

SEE OR SEARCH CLASS:
73, Measuring and Testing, subclass 705 for photoelectric fluid pressure gauges.

232 This subclass is indented under subclass 229. Subject matter having means for intermittently interrupting the optical path between the light source and photocell in a repetitious cyclic sequence.

(1) Note. A camera shutter is generally not a light chopper, of the type found in this class, since it opens and closes in a non-repetitious, noncyclic manner.

233 This subclass is indented under subclass 232. Subject matter in which the means for intermittently interrupting the optical path is a rotary element.

234 This subclass is indented under subclass 216. Subject matter having means for moving an element of the optical system.

(1) Note. Examples of such means are means for adjusting the photocell so that its axis is aligned with the optical axis, a hand crank for adjusting the photocell to sense in a desired direction or a vehicle upon which the entire photocell apparatus is mounted.

SEE OR SEARCH THIS CLASS, SUBCLASS:
218, for photocell sensing means in which a fluent material is moved through the optical path between light source and photocell.
223, and 224, for photocell sensing means in which an inanimate object is moved to or from or while in the optical path.
229+, for photocell sensing means having a light valve in the optical path, particularly indented subclass 231, where the light valve is adjusted in accordance with an external physical quantity and subclasses 232+, where the light valve continuously moves to chop the light.
559.01+, and 566+, for similar subject where the object is a coded record or a web, strand, strip or sheet which is conveyed to the sensing point.

235 This subclass is indented under subclass 234. Subject matter having means for cyclically moving an element of the optical system in a repetitious path.

(1) Note. This subclass includes photocell devices having a vibratory scanner. An adjusting means is not deemed a means for providing a repetitious path, since there is no means for ensuring repetition or cycling. A hunting device which follows another element does not cycle, even though the followed element may, during its motion, fortuitously cycle.

236 This subclass is indented under subclass 235. Subject matter in which the element of the optical system, which moves in a cyclic path, rotates.

SEE OR SEARCH CLASS:
348, Television, subclasses 199+, 202, and 203+ for Nipkow discs and rotating mirrors.

237 This subclass is indented under subclass 216. Subject matter having a hood, grating, baffle, diaphragm or mask associated with the optical path between light source and photocell.

SEE OR SEARCH THIS CLASS, SUBCLASS:
229+, for similar subject matter where the means associated with the optical path between light source and photocell are ajdustable.

238 This subclass is indented under subclass 200. Subject matter having means for controlling the temperature of the photocell apparatus.

(1) Note. If the temperature of nonphotocell apparatus is controlled, search should not be made here, but rather in the nonphotocell art concerned.

239 This subclass is indented under subclass 200. Subject matter having a housing for the photocell apparatus.

250 This subclass is indented under the class definition. Subject matter which includes sensing means responsive to electromagnetic radiation including a variable electrical member or variable radiation control member having a pointer and an associated scale calibrated in frequency or wavelength units and indicating means responsive to the sensing means to note the maximum energy detected by the sensing means whereby the scale and pointer indicate the wavelength or frequency of the radiation detected.

251 This subclass is indented under the class definition. Subject matter comprising means for producing or utilizing a unidirectional stream of molecules or atoms having no net electrical charge, usually through a vacuum with thermal velocity and methods using such means. Such devices and methods may include magnetic field means to deflect, divert or select a portion of the beam of a desired energy level and may also provide means for subjecting the selected portion of the beam to a microwave electromagnetic field to excite the molecules or atoms of the beam at a resonant frequency, causing a transition of the energy state of the molecules or atoms from one energy-level to another.

SEE OR SEARCH THIS CLASS, SUBCLASS:
281, for means for effecting the ionic separation or analysis of materials, (e.g., mass spectrometry).

SEE OR SEARCH CLASS:
122, Liquid Heaters and Vaporizers, for metal and apparatus to heat and vaporize a material by nonelectric means.
219, Electric Heating, subclasses 271+ for electric heating of solids and liquids to vaporize the material where no structure to use the vapor is claimed.
239, Fluid Sprinkling, Spraying, and Diffusing, particularly subclasses 79+ for apparatus including means to melt particles or bodies of normally solid substance and contiguous means to project the melted substance through the ambient air.
313, Electric Lamp and Discharge Devices, subclasses 231.01+ for space discharge devices with fluent material supply or directing means.
314, Electric Lamp and Discharge Devices: Consumable Electrodes, subclass 22 for consumable electrode discharge devices which have means to feed a fluent material, (e.g., solid particles) to the discharge space.
315, Electric Lamp and Discharge Devices: Systems, especially subclass 111.01 for systems wherein a fluent material is supplied to the discharge area between the discharge electrodes of the discharge device.
324, Electricity: Measuring and Testing, subclasses 332+ for measuring or testing devices for utilizing or determining molecular particle resonant properties of substances.

330, Amplifiers, particularly subclasses 4+ for maser type amplifying devices that may utilize molecular or atomic beams.

331, Oscillators, particularly subclass 3 for oscillators with automatic frequency stabilization utilizing molecular resonant means.

372, Coherent Light Generators, appropriate subclasses for molecular or particle resonant type oscillators, (e.g. masers, lasers), which oscillators may utilize molecular or atomic beams.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, appropriate subclasses for apparatus or process for effecting a reaction within the nucleus of an element utilizing, for example, subatomic particles, such as thermal neutrons.

252.1 CALIBRATION OR STANDARDIZATION METHODS:

This subclass is indented under the class definition. Subject matter which includes methods to establish a reference indication of invisible radiation or invisible radiation level, or methods of error determination or correction using a reference indication or radiation level.

(1) Note. For calibration or standardizing apparatus, see the appropriate subclasses for the specific structure involved.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclass 207 for testing or calibration of X-ray devices.

253 This subclass is indented under the class definition. Subject matter s which includes means in combination with material within or on the surface of the earth to, (1) expose the material to radiation, (2) to detect radiation emanating naturally from the material or (3) to detect radiation modified or caused by the material interacting with radiation produced by the means to expose the material to radiation, and methods therefor.

(1) Note. The material within or on the surface of the earth includes the surface of, underneath the surface of or the bottom of a naturally occurring body of water.

(2) Note. The irradiation of material includes material within or about a well.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 152.01+ for measuring a characteristic of a borehole, a borehole casing, or a drill rigging wherein the measuring is not purely electrical or purely magnetic.

181, Acoustics, subclass .5 for geophysical exploration by use of seismic waves.

324, Electricity: Measuring and Testing, subclasses 323+ for geophysical surface and subsurface examination using electrical tests and electromagnetic waves below the infrared frequency band in the electromagnetic spectrum.

367, Communications, Electrical: Acoustic Wave Systems and Devices, subclasses 14+ for seismic prospecting using electrical acoustic wave systems.

436, Chemistry: Analytical and Immunological Testing, subclasses 25+ for methods of prospecting using chemical analysis.

254 This subclass is indented under subclass 253. Subject matter which includes apparatus to bore a well and includes methods corresponding to the apparatus.

SEE OR SEARCH CLASS:

166, Wells, subclass 247 for processes of treating wells using nuclear energy or radioactivity; subclasses 250+ for processes including wells, in combination with indicating, testing or measuring and subclass 66 for apparatus in combination with a well for giving electrical signals concerning something in relation to the well. See also section VI of the general notes to Class 166.

175, Boring or Penetrating the Earth, particularly subclass 41 for the combination of boring or drilling with a radiant energy test. See subclass 40, (3) Note for the line between Class 250 and Class 175.

255 This subclass is indented under subclass 253. Subject matter which additionally includes means to remove a portion of the material from the earth whereby the portion is subjected to (1) the means to detect natural radiation or (2) radiation modified or caused by the portion when irradiated by means to expose or (3) some other test.

(1) Note. The subject matter of this subclass includes sampling on the surface of the earth within a well or at the bottom of a naturally occurring body of water.

SEE OR SEARCH THIS CLASS, SUBCLASS:

304, for methods of preparing or separating material for an invisible radiation test or controlling the material during the test.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclass 152.07 for borehole formation logging with analysis of density, porosity, or water saturation using core sample analysis, subclass 152.09 for oil, gas, or water saturation by core sample analysis, and subclass 152.11 for other analysis using core sampling.

436, Chemistry: Analytical and Immunological Testing, subclasses 25+ for geochemical exploration.

256 This subclass is indented under subclass 253. Subject matter wherein the means to detect radiation emanating naturally from or modified or caused by the material interacting with radiation senses the material in or about a well and includes means to support for movement the means to detect natural radiation or radiation modified or caused by the interaction of the material with exposing radiation and includes methods corresponding to the apparatus.

(1) Note. A well is meant to include a cased and uncased well and bore hole.

(2) Note. Generally the claimed method and apparatus include an indication or a recording of the radiation detected.

(3) Note. Generally the method and apparatus have claimed or disclosed a recording correlating the radiation sensed with the depth at which the radiation has been sensed.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 152.01+ for physical analysis of wells particularly subclasses 152.02+, for the identification of strata in a well by physical methods or apparatus.

166, Wells, subclasses 250+, for well processes involving indicating, testing or measuring in combination with a well and subclasses 64 and 66+, for measuring or electrical means combined with a well.

175, Boring or Penetrating the Earth, subclass 41 for ray energy detection or measuring apparatus combined with drilling apparatus and subclasses 57+ for processes of boring or penetrating the earth.

181, Acoustics, subclass .5 for well exploration by use of seismic waves.

324, Electricity: Measuring and Testing, subclasses 323+ for well exploration by electrical, magnetic and radio waves.

340, Communications: Electrical, subclasses 853.1+ for telemetering a well.

346, Recorders, subclass 33 for a recorder used in a well logging operation.

257 This subclass is indented under subclass 256. Subject matter which additionally includes apparatus which includes a detector to sense the location of a pipe collar in a cased well and methods corresponding to the apparatus.

(1) Note. The collar detector need not be a radiation detector but can be any type which senses the position of the pipe collar in a well.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclass 152.57 for a determination of a characteristic of a borehole casing wherein the determination is made by making

a measurement which is not purely electrical or purely magnetic.

258 This subclass is indented under subclass 256. Subject matter which includes means to cause two fluids to meet in a well to force one of the fluids into the earth, said one fluid being material or including material which emanates radiation, modified radiation, or causes radiation by interacting with radiation from the means to expose the material to radiation, wherein the means to detect radiation senses the said one fluid at the meeting point of the fluids, and methods corresponding to the apparatus.

(1) Note. Generally, the depth at which the meeting point of the fluids occurs is recorded along with the results of the sensing.

SEE OR SEARCH THIS CLASS, SUBCLASS:

259+, for fluids added to a well which may be or contain tracer material which is fluorescent or radioactive or capable of being made radioactive by irradiation.

259 This subclass is indented under subclass 256. Subject matter which includes means to add the material into the well or the earth about the well whereby the means to detect senses the radiation emitted naturally from the material, or radiation caused by or modified by the material interacting with the radiation produced by the means to expose the materials to radiation.

(1) Note. The material may be solid liquid, gas, particulate or entrained within a fluid.

(2) Note. The means to eject the tracer material into a well is included here as a subcombination not classified elsewhere.

(3) Note. Materials which are not radioactive, but are made radioactive in the well are placed here along with materials which can control radiation in some manner.

SEE OR SEARCH THIS CLASS, SUBCLASS:

302+, for methods detecting tracer materials which emit or modify radiation generally.

260 This subclass is indented under subclass 259. Subject matter wherein the added material is radioactive or contains radioactive material entrained in a substance added to the well.

SEE OR SEARCH THIS CLASS, SUBCLASS:

259, for tracers which must be irradiated in the well before they become radioactive.

303, for methods detecting radioactive tracers generally.

493.1+, for radioactive sources which are more than a composition, recited as a source.

SEE OR SEARCH CLASS:

252, Compositions, subclass 301.1 for radioactive compositions.

424, Drug, Bio-Affecting and Body Treating Compositions, subclass 1 for a radioactive composition for medical use.

600, Surgery, subclasses 1+ for radioactive substances applied to the body for therapeutic purposes and holders therefore.

261 This subclass is indented under subclass 256. Subject matter wherein the means to detect radiation emanating naturally or radiation modified or caused by the material interacting with the radiation includes a detector and may include an electrical circuit responsive to the detector and apparatus to control or compensate for some physical or electrical condition of the radiation detector circuit or detector and circuit and includes methods corresponding to the apparatus.

(1) Note. The conditions controlled include temperature control, voltage control of the detector or circuit and the speed of the detector while sensing in the well.

SEE OR SEARCH CLASS:
62, Refrigeration, subclass 260 for temperature control in a geographic location such as a well.

262 This subclass is indented under subclass 256. Subject matter wherein the means to detect radiation emitted naturally or radiation modified or caused by material interacting with radiation includes a radiation detector and a detailed electrical circuit connected between the detector and an indicator or recorder of the radiation sensed by the detector and includes methods corresponding to the apparatus.

263 This subclass is indented under subclass 262. Subject matter wherein the electrical circuit includes means to modulate an electrical wave with signals emitted by the detector upon detecting radiation and includes methods corresponding to the apparatus.

264 This subclass is indented under subclass 262. Subject matter wherein there are plural detectors and the individual detectors may be connected to the same electrical circuit or to separate electrical circuits and includes methods corresponding to the apparatus.

(1) Note. Included are plural detectors connected to an anti-coincidence or coincident circuit.

SEE OR SEARCH THIS CLASS, SUBCLASS:
265+, for well-logging circuits having plural detectors where no novelty is in the electrical circuit.

265 This subclass is indented under subclass 256. Subject matter wherein the means to detect radiation emitted naturally or radiation modified or caused by material interacting with radiation includes plural radiation detectors and methods corresponding to the apparatus.

(1) Note. The detectors here may be electrical, nonelectrical, but a combination of a fluorescent screen and a responsive detector is considered but one detector.

SEE OR SEARCH THIS CLASS, SUBCLASS:
264, for well testing apparatus using plural radiation detectors wherein the novelty resides in the electrical circuitry between the detectors and a recorder or indicator.

266 This subclass is indented under subclass 265. Subject matter which may include the means to expose the material to radiation which includes at least a radiation source and wherein there are details concerning the location or spacing of the detectors with respect to the source or to one another or the direction the radiation is permitted to be incident upon the detectors and includes methods corresponding to the apparatus.

267 This subclass is indented under subclass 256. Subject matter wherein the means to detect radiation emanating naturally or radiation modified or caused by the material interacting with the radiation includes a detector and includes radiation modifying means to control the radiation incident upon the detector and methods corresponding to the apparatus.

(1) Note. The control of the radiation to the detector includes type of radiation, the intensity of radiation, the direction of the radiation hitting the detector, the frequencies of the radiation, the radiation pattern arriving at the detector or the spacing of the detector with respect to source.

SEE OR SEARCH THIS CLASS, SUBCLASS:
266, for radiation logging apparatus having plural detectors wherein the spacing of the detectors to each other or to a source or the direction if the radiation reaching the detector is claimed.
505.1+, for radiation controlling attenuators directional elements, filters, shutters, cones, apertures and shields.

268 This subclass is indented under subclass 256. Subject matter which includes means to touch the wall of the well, the means to support for movement suspending the means to touch the well and the means to detect radiation as a

common unit within the well and methods corresponding to the apparatus.

SEE OR SEARCH CLASS:

33, Geometrical Instruments, subclasses 783+ for opposed contact type measuring instruments.

73, Measuring and Testing, subclass 152.17 for a formation logging device combined with detail of a borehole wall engaging means wherein the logging is made by making a measurement which is not purely electrical or purely magnetic.

269.1 With source and detector:

This subclass is indented under subclass 256. Subject matter in which means to expose the material to radiation in or about the well is also supported by the means to support for movement the means to detect radiation, and includes methods corresponding to the apparatus.

269.2 With plural types of detectors:

This subclass is indented under subclass 269.1. Subject matter wherein the means to detect radiation includes more than one different type of detector (e.g., a gamma detector and a neutron detector).

269.3 Having gamma source and gamma detector:

This subclass is indented under subclass 269.1. Subject matter wherein the means to expose the material to radiation includes a gamma ray source and the means to detect radiation modified or caused by the material includes a gamma ray detector and includes methods corresponding to the apparatus.

SEE OR SEARCH CLASS:

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclass 157 for gamma ray activation analysis.

378, X-Ray or Gamma Ray Systems or Devices, subclass 88 for gamma ray composition analysis.

269.4 Having neutron source and neutron detector:

This subclass is indented under subclass 269.1. Subject matter wherein the means to expose the material to radiation includes a neutron radiation source, and the means to detect radiation modified or caused by the material includes a neutron radiation detector, and includes methods corresponding to the apparatus.

SEE OR SEARCH THIS CLASS, SUBCLASS:

390.04, for composition analysis with neutron responsive means.

SEE OR SEARCH CLASS:

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 160+ for subterranean neutron activation analysis.

269.5 Having thermal neutron detector:

This subclass is indented under subclass 269.4. Subject matter wherein the neutron radiation detector detects neutrons with thermal energy levels (in contrast to detecting neutrons with fast or epithermal energy levels).

269.6 Having neutron source and gamma detector:

This subclass is indented under subclass 269.1. Subject matter wherein the means to expose the material to radiation includes a neutron radiation source, and the means to detect radiation modified or caused by the material includes a gamma ray detector, and includes methods corresponding to the apparatus.

SEE OR SEARCH CLASS:

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 160+ for subterranean neutron activation analysis.

269.7 With plural gamma detectors:

This subclass is indented under subclass 269.6. Subject matter wherein the means to detect radiation includes two or more gamma ray detectors.

SEE OR SEARCH THIS CLASS, SUBCLASS:

264, for well testing apparatus with particular detector signal circuit having plural detectors.

265+, for well testing apparatus with plural detectors in general.

269.8 With detection in plural consecutive time intervals:

This subclass is indented under subclass 269.6. Subject matter wherein the detection method includes detecting gamma rays in two or more time intervals which occur after the beginning of a neutron pulse or burst from the neutron radiation source, but before the beginning of a subsequent neutron pulse or burst.

271 This subclass is indented under the class definition. Subject matter comprising data bearing means containing information in symbolic form and detection means to sense invisible radiation from or modified by the form to produce an electric signal corresponding to the form, and methods of using such means.

(1) Note. The symbolic forms of this subclass type represent information by convention only. Thus, for example, a photograph of an object is not a symbolic form of the object because it does not represent the object by convention.

(2) Note. Included are fluorescent, radioactive and radiation controlling markings.

SEE OR SEARCH THIS CLASS, SUBCLASS:

825.3+, for intelligence comparison.

SEE OR SEARCH CLASS:

235, Registers, subclass 468 for record analyzing devices which examine records serially by radiation and subclass 491 for coded record cards having fluorescent, phosphorescent or radiation emitting markings.

313, Electric Lamp and Discharge Devices, subclasses 483+ for electroluminescent devices.

346, Recorders, subclasses 74.1 and 107.1+ for the production of records utilizing electromagnetic energy to record phenomenal information.

347, Incremental Printing of Symbolic Information, subclasses 111+ for electric marking apparatus and processes and subclasses 224+ for radiation marking apparatus and processes.

356, Optics: Measuring and Testing, subclass 71 for document pattern light analyzers.

365, Static Information Storage and Retrieval, subclasses 106 and 120 for radiant energy and information masking, respectively, for the static storage/retrieval of information.

369, Dynamic Information Storage or Retrieval, subclass 101 for dynamic recording or reproducing by invisible radiation.

382, Image Analysis, appropriate subclass for pattern or character recognition systems, see Class 382 II B (1) Note.

281

This subclass is indented under the class definition. Subject matter comprising (1) means to select an ion of one charge-to-mass ratio from one or more ions of a different charge-to-mass ratio and (2) means to either detect the selected ions or accumulate them, or methods for performing the functions of the means (1) and (2).

(1) Note. Combination claims including a mass Spectrometer or Calutron recited as a part of the combination will be included here and the subclasses indented hereunder even if merely nominally recited on the assumption that the nominally recited mass Spectrometer or Calutron includes (1) and (2) of the subclass definition. If the disclosure shows some other ionic separation or analysis means, the document is excluded. Claims reciting subject matter “in” or “for use in” a mass Spectrometer or Calutron are excluded from this subclass and its indents and are classified elsewhere. See Search Notes below.

(2) Note. Where the selection is on the basis of the polarity only of the ionized particles, classification here is excluded See search notes to Classes 95 and 96.

SEE OR SEARCH THIS CLASS, SUBCLASS:

396+, for ionic lens means, per se, or in combination with an ion source for separating ions according to their charge-to-mass ratios but without the

detecting or accumulating means, per se.

423+, for ion sources, per se, of the class type.

489+, for ion accumulating means, per se.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclass 23.1 for the combination of a gas chromatograph and a nominally recited mass spectrometer.

95, Gas Separation: Processes, especially subclasses 27 and 28 for processes of gas separation using magnetism and subclasses 57+ for processes of gas separation using an electric or electrostatic field wherein the separation of gases and solid particles from gases is accomplished by methods other than the ionic separation of materials utilizing the charge-to-mass ratio of particles. Such gases may include the polarity or the charged status of the particles.

96, Gas Separation: Apparatus, especially subclasses 1+ for magnetic separating means for gas separation and subclasses 15+ for electric or electrostatic field separation apparatus for gas separation wherein the means to separate gases and solid particles from gases is means other than that for the ionic separation of materials utilizing the charge-to-mass ratios of particles. Such gases may include the polarity or the charged status of particles.

324, Electricity: Measuring and Testing, subclasses 459+ for electric measuring and testing devices including ionization, e.g., pressure gages.

282 This subclass is indented under subclass 281. Subject matter comprising processes including the steps of selecting ions of one mass-to-charge ratio from ions of different mass-to-charge ratios and detecting or accumulating the selected ions.

283 This subclass is indented under subclass 282. Methods which include the step of collecting one or more groups of ions having the same electrical charge-to-mass ratio.

284 This subclass is indented under subclass 283. Subject matter wherein the collection of ions is for the express purpose of recovery of the ionized material.

285 This subclass is indented under subclass 281. Subject matter having two or more means to produce ions acting at the same time to supply ions to the selecting means.

286 This subclass is indented under subclass 281. Subject matter having means to intermittently produce or interrupt a flow of ions into the selecting means and means controlling the detector to vary its response in some manner in timed relation to the beam producing or interrupting means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

290+, for pulsed ion-accelerating selecting means without synchronizing means for the detector.

287 This subclass is indented under subclass 286. Subject matter having detector means or means responsive to the detector that exhibits a representation of the time it takes a selected ion to travel a given distance.

(1) Note. Examples of time-of-flight indicators of this subclass type include cyclically swept cathode ray tubes and "event" response frequency counters.

288 This subclass is indented under subclass 281. Subject matter having handling means for the material to be ionized for the selecting means.

289 This subclass is indented under subclass 281. Subject matter having means producing a subatmospheric pressure environment for the selecting means or means to maintain the pressure of the environment of the selecting means sub atmospheric.

290 This subclass is indented under subclass 281. Subject matter wherein the ion selecting means comprises means for varying at regular intervals the direction or magnitude of an electric or magnetic field.

(1) Note. The fields involved in the subject matter of this subclass are generally for intermittently accelerating ions or causing them to oscillate, the average velocity of the accelerated ions and the frequency of the oscillating ions being functions of the fields and the charge-to-mass ratio of the ions. Cyclically varying field means in ionic separation or analysis apparatus are not necessarily classifiable here. See search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

286, for cyclically varying beam pulsing means external to the selecting means and in combination with magnetic selecting means for varying the radii of the separated ion paths.

295, for cyclically varying ion accelerating means in combination with magnetic selecting means for varying the radii of the separated ion paths.

291 This subclass is indented under subclass 290. Subject wherein the field means produces a desired ion path of motion containing a unidirectional curvature of greater than 180 degrees.

(1) Note. The "Circular" path need not be uniplanar. Thus, field means producing spiral paths will be found in this subclass.

292 This subclass is indented under subclass 281. Subject matter wherein the selecting means comprises field means causing alternating deflection of the ions normal to their general forward motion.

293 This subclass is indented under subclass 290. Subject matter wherein the ion selecting means includes a polarized field whose direction of polarization changes cyclically.

(1) Note. Means producing selecting fields which vary in magnitude cyclically but not in direction are not classified in this subclass, but in 290 above. The field means classified here tend to produce oscillations of the ions rather than intermittent unidirectional accelerations.

294 This subclass is indented under subclass 281. Subject matter wherein the selecting means comprises a normally nonvarying electric or magnetic field.

(1) Note. The field means of this subclass and the subclasses indented hereunder typically interact with the charges of the ions to bend the path of an ion an amount depending on its mass and charge.

(2) Note. Although the field means of this subclass and the subclasses indented hereunder are normally nonvarying, those field means that have means to adjust their intensity or direction are not precluded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

396+, for ion path bending field means, per se, or in combination with sources. Ion path bending field means with detectors will also be found there if the field means does not separate ions of different charge-to-mass ratios.

295 This subclass is indented under subclass 294. Subject matter having, in addition to the ion selecting field means, variable field means to change the path of a stream of ions.

296 This subclass is indented under subclass 294. Subject matter including in addition to a first type static field ion selecting means, another static field of a different type ion path bending means which may be for the purpose of selecting ions of one charge-to-mass ration from ions of another charge-to-mass ratio or for some other purpose such as accelerating or focusing the ions.

(1) Note. The plural diverse types of field means of the subject matter of this subclass are generally magnetic and electro static.

SEE OR SEARCH THIS CLASS, SUBCLASS:

396+, for electrical beam focusing means, per se, and in combination with ion sources or detectors.

297 This subclass is indented under subclass 296. Subject matter wherein diverse field means act simultaneously and within a single evacuated container to deflect the ions more than 180 degrees or to cause paths which are not confined to one plane.

(1) Note. Most of the subject matter pertains to ion separation during a circular, spiral or cycloidal ion-flight path.

SEE OR SEARCH THIS CLASS, SUBCLASS:
291, for devices causing similar ion paths by means of alternating fields.

298 This subclass is indented under subclass 294. Subject matter wherein the ion selecting means is a magnetic field.

299 This subclass is indented under subclass 298. Subject matter including signalling means responsive to the selected ions.

SEE OR SEARCH THIS CLASS, SUBCLASS:
336.1+, for ion responsive electric signalling means, per se.
472.1+, for ion responsive nonelectric signalling means, per se.

300 This subclass is indented under subclass 299. Subject matter including means to change the response of the ion responsive means or to keep it constant.

301 This subclass is indented under the class definition. Subject matter which includes methods of examining materials for the presence or absence of oil, the amount of oil present in the material, the contamination of oil or the contamination of material by oil by subjecting the material to a radiation test.

(1) Note. The material examined includes liquid and solid materials, petroleum and petroleum products, and products, and sample material after it has been removed from the earth.

(2) Note. Generally the radiation used for the test is ultraviolet radiation but any type of radiation can be employed.

(3) Note. Visual and automatic methods of testing of oil are here.

SEE OR SEARCH THIS CLASS, SUBCLASS:
253+, for testing methods including taking samples from the earth or testing on or within the earth for oil.
302+, for methods using fluorescent tracer material generally.
304, for methods involving nonradiation treatment of test materials or the separation of test materials or the separation of test materials before or after a radiation test.
362, for methods of testing material which luminescence in response to radiation and an electrical detector detects the luminescence.
432+, for irradiating supported transported or contained material.
459.1, for methods of irradiating luminescent material.

302 This subclass is indented under the class definition. Subject matter which includes methods of applying a material onto a surface, into a substance, into a closed or open pipe, or into a fluid, static or moving, and detecting the radiation emitted naturally or as secondary radiation as a result of irradiation of the material or a modification of radiation caused by the material for any purpose not provided for else where.

(1) Note. Subject matter of this subclass includes flow testing methods using fluorescent material and a radiation source to cause the material to give off light.

(2) Note. The combination of a tracer with a manufacturing or an art process will go with the manufacturing or art process; also, articles of manufacture with a tracer for this class will be found with the manufactured item.

SEE OR SEARCH THIS CLASS, SUBCLASS:
259+, for tracer methods used in or about a well.
459.1, for methods involving the irradiation of luminophors.

483.1, for luminescent devices generally.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 104+ for surface or cutting edge testing methods and apparatus; and subclass 861.07 for volume or rate of flow meters measuring tracer concentration.

252, Compositions, subclasses 301.16 through 301.6 for luminescent compositions and subclass 408 for testing or indicating compositions.

324, Electricity: Measuring and Testing, subclasses 216, 451, and 452+, respectively, for the combination using electrostatically and magnetically charged particles for detecting for flaws with or without a fluorescent or radioactive tracer.

356, Optics: Measuring and Testing, subclasses 237.1+, 426+, and 430+ for flaw testing by optical or visual methods or apparatus.

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 9.1+ for in vivo diagnosis and testing compositions with subclasses 9.6 and 9.61 containing compositions producing in vivo fluorescence and subclasses 9.7, 9.71, 9.8, and 9.81 containing compositions which produce a visible change in the mouth or on the skin and subclasses 10.1+ for Class 424 compositions with an identification or warning feature which may involve color or a color change.

600, Surgery, subclasses 1+ for radioactive materials applied to the body for therapy, as well as devices for holding or applying radioactive materials, and subclasses 407+ for imaging of a part or the entire human body.

303 This subclass is indented under subclass 302. Subject matter wherein the material is or includes a radioactive substance.

SEE OR SEARCH THIS CLASS, SUBCLASS:

260, for radioactive tracer methods used in wells.

493.1, for radioactive tracers not found elsewhere.

SEE OR SEARCH CLASS:

252, Compositions, subclasses 625+, especially 646 for radioactive compositions

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 1.11+ for the class defined compositions and methods comprising a radionuclide or intended radionuclide.

304 This subclass is indented under the class definition. Subject matter which includes methods of preparing a material or separating one material from other materials for an invisible radiation test or controlling a material while being tested by invisible radiation and subjecting the material so prepared, separated or controlled to a radiation test.

(1) Note. Preparation or controlling includes acting upon the test material so that the radiation test can be performed and includes temperature and pressure control of the material, mixing, grinding, drying and chemical and physical reactions as long as no details are given of the chemical or physical process.

SEE OR SEARCH CLASS:

73, Measuring and Testing, particularly subclasses 863+ for a sampler.

356, Optics: Measuring and Testing, subclasses 36+ for the preparation of material and testing of the prepared material by an optical test.

436, Chemistry: Analytical and Immunological Testing, subclasses 1+ for methods having a chemical reaction or a physical separation process involving a test material and the examination of the material by radiation.

305 This subclass is indented under the class definition. Subject matter having means for or method of separating electrons according to their respective energies (including velocity and momentum) and detecting the separated electrons.

(1) Note. The separated electrons may include one or more energy level groups.

(2) Note. The separation may occur in static or dynamic electric or magnetic deflecting, focusing or repelling fields.

(3) Note. The electrons usually result from the bombardment of a solid, liquid or gas sample (a) with electromagnetic radiation or charged or neutral particles causing the emission of electrons from the sample or (b) with primary electrons diffracted by or transmitted through the sample.

SEE OR SEARCH THIS CLASS, SUBCLASS:

281+, for similar systems for separating ions according to charge-to-mass ratio.

306+, for electron inspection systems wherein the induced, diffracted or transmitted electrons are detected irrespective of energy level.

396+, for electron deflection systems for deflecting electrons irrespective of energy.

306 This subclass is indented under the class definition. Subject matter wherein the apparatus comprises a source of or means which impels charged particles toward a nongaseous object or material to be studied and both means to support, position or accommodate the object or material relative to the source or a detector, and means to detect such particles that pass near to or through the object or material, or are reflected from or diffracted by said object or material, or secondary radiation emitted from the object or material.

(1) Note. The secondary radiation emitted by the object or material may be X-rays, however, placement here requires examination of the object or material rather than merely bombarding a target to generate X-rays.

SEE OR SEARCH THIS CLASS, SUBCLASS:

336.1+, for this combination with an electric detector where the object is not studied.

399, for X-ray generation with deflection, scanning, spreading or focusing of the beam of electrons or ions bombarding a target.

423+, for ion generators with focusing means not of the beam lens type.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 861.05, 861.07, and 861.09 for the measurement of the volume or rate of flow of charged particles.

378, X-Ray or Gamma Ray Systems or Devices, subclass 138 for X-ray tube with focusing means not of the beam lens type.

307 This subclass is indented under subclass 306. Subject matter which includes processes for inspecting an object or material with charged particles.

308 This subclass is indented under subclass 306. Subject matter wherein the source of charged particles comprises a radioactive material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

336.1+, especially subclasses 363.01, 364, 380, 381, and 384, for electrical detectors combined with radioactive sources of charged particles where no object positioning means is included in the combination.

SEE OR SEARCH CLASS:

164, Metal Founding, subclass 450.2 for a metal casting apparatus including control means influenced by a radioactive sensor.

309 This subclass is indented under subclass 306. Subject matter wherein the charged particles are positively charged.

310 This subclass is indented under subclass 306. Subject matter having means to project a concentrated beam of electrons against the object or material, and means to detect secondary radiation emitted from the object or material, or electrons deflected by the object or material.

311 This subclass is indented under subclass 306. Subject matter wherein electrons are impelled toward the object or material and the particles detected are electrons which have passed near

or through the object or material without substantial deflection.

SEE OR SEARCH THIS CLASS, SUBCLASS:

440+, for object supports with or without a source.

315.3 SOURCE WITH CHARGED PLATE-TYPE DETECTOR:

This subclass is indented under the class definition. Subject matter which includes a charged member and a source of invisible radiation to irradiate the charged member, or the step of irradiating the charged member, to alter the charge on the member in response to the radiation.

(1) Note. Means for or the step of charging the detector may be included in this subclass in combination with the source and charged plate-type detector.

(2) Note. The subject matter of this subclass may be in combination with means to hold, position or accommodate an object in the path of the radiation from the source to the detector, generally for the purpose of producing on the detector an image of the object.

SEE OR SEARCH THIS CLASS, SUBCLASS:

324+, for apparatus for or the method of corona irradiation to charge the detector without subsequent altering of the charge.

SEE OR SEARCH CLASS:

8, Bleaching and Dyeing; Fluid Treatment and Chemical Modification of Textiles and Fibers, subclass 444 for dyeing processes; and subclass 103 for bleaching processes involving the use of corona irradiation.

23, Chemistry: Physical Processes, for both methods and apparatus, for effecting chemical reactions by means of corona irradiation.

34, Drying and Gas or Vapor Contact With Solids, subclasses 245+ and 266+ for processes involving the use of corona radiation.

99, Foods and Beverages: Apparatus, subclasses 358 and 451 for apparatus for subjecting foods and beverages to wave, radiant and electrical energy.

118, Coating Apparatus, subclasses 620+ for coating apparatus combined with means to apply corona radiation to the work.

204, Chemistry: Electrical and Wave Energy, subclasses 156 and 164+ for processes for performing chemical reactions within an electric space discharge field, subclasses 554+ and 660+ for methods and apparatus specialized for electrical or simultaneous electrical and magnetic separation or purification of a liquid or for magnetic treatment of a liquid (other than separation), and subclasses 192.1+ and 298.01+ for methods and apparatus specialized for coating, forming, or etching objects by sputtering (e.g., coating within a gaseous medium by the action of an electrical space discharge to sputter coating material onto a substrate, etc.).

313, Electric Lamp and Discharge Devices, for the electric lamp or discharge device, per se.

355, Photocopying, subclasses 3+ for apparatus and method of electric photocopying with visible light (which includes means for charging).

378, X-Ray or Gamma Ray Systems or Devices, subclasses 28+ for xeroradiography.

422, Chemical Apparatus and Process Disinfecting, Deodorizing, Preserving, or Sterilizing, especially subclasses 22+ for processes of disinfecting, deodorizing, preserving or sterilizing nonfoods; and subclasses 129+, especially subclass 185 for apparatus using corona radiation for effecting chemical reactions.

426, Food or Edible Material: Processes, Compositions, and Products, subclasses 234, 236 and 237+ for processes involving the use of electrical, wave or radiant energy in food treatments.

427, Coating Processes, subclasses 457+ for processes of coating using electrical or wave energy.

607, Surgery: Light, Thermal, and Electrical Application, subclasses 1+, and especially indented subclasses 154+ for surgical appliances and devices which include means for applying an electrical space discharge to the human body and which are limited by claimed subject matter to therapeutic use.

316.1 With infrared or thermal pattern recording: This subclass is indented under the class definition. Subject matter having a surface responsive to an infrared or heat pattern and a recording means which may be the responsive surface or a separate means responsive to the surface whose response outlasts its exposure to the pattern.

(1) Note. The pattern referred to above is the thermal or radiation field configuration which is present at the surface of the detector.

(2) Note. The response of the recording means may be visible or invisible (latent). Where the response is latent, additional structure may be included to make it visible, (e.g., develops).

(3) Note. This and the indented subclasses provide for methods associated with the recording apparatus as well as the apparatus itself.

SEE OR SEARCH THIS CLASS, SUBCLASS:

330, for nonrecording infrared to visible imaging systems.

317.1 Thermal copying of documents: This subclass is indented under subclass 316.1. Subject matter which includes additionally a source of infrared radiation and a sheet type document having visual information thereon which information selectively absorbs the radiation from the source to form a thermal image of the information thereon, the responsive surface being responsive to the thermal image to cause the recording means, a copy sheet, to form a latent or visual duplicate of the information.

(1) Note. A document for this subclass is a two-dimensional sheet of paper which has on one or both sides of the sheet visual information in the form of a graph, picture, writing, handwritten or printed, from which a duplicate is to be made.

(2) Note. The copy sheet is both the detector and the recording means.

SEE OR SEARCH CLASS:

101, Printing, subclasses 765+ methods and apparatus for lithographic plate making and copying by means of using radiant or dual energy to make the copy.

281, Books, Strips, and Leaves, subclasses 15+ for a group of sheets, one being a transfer sheet and the other a copy sheet.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, for imaging process using infrared radiation with chemically defined material and for chemically defined products useful for detecting or reviewing an image by infrared radiation.

318 This subclass is indented under subclass 317. Subject matter having (1) a transfer member which receives the thermal image by heat conduction from the document and the member passes the said heat image on to the recording means which is a copy sheet or (2) a transfer member having material which is transferred to the copy sheet as a result of a thermal image received by the member from the document or (3) a transfer member which receives a thermal image from the copy sheet and as a result thereof transfers material from the member to the copy sheet to form a latent or visible image of the copy sheets.

(1) Note. The transfer member may be a sheet, roll or web.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, particularly subclasses 129+ and 209 for endless and rotary conveyors generally.

271, Sheet Feeding or Delivering, subclasses 3.01+ for feeding sheet material from a supply and delivering the sheet material to a compartment, subclasses 8.1+ for feeding sheet material from a supply and subclasses 63+ for delivering sheet material to a compartment.

319 This subclass is indented under subclass 317. Subject matter which includes a conveying device to move the document, the copy sheet or the document and the copy sheet past the infrared source or the infrared source past the document and copy sheet.

SEE OR SEARCH CLASS:
198, Conveyors: Power-Driven, for power conveyors generally.
271, Sheet Feeding or Delivery, for conveyors to move sheet material one at a time from a sheet supply to a sensing station or from a sensing station to a delivery point.

324 This subclass is indented under the class definition. Subject matter wherein means are provided for impacting an object with gas ions resulting from an incomplete electrical discharge from an electrode.

(1) Note. The subject matter of this subclass includes method of and apparatus for irradiating an object to alter some physical characteristic of the object.

(2) Note. For the classes and subclasses which provide for irradiating to bleach, preserve, dry, treat, copy, etc. See the classes specified in the notes to subclass 315.

SEE OR SEARCH THIS CLASS, SUBCLASS:
315.3, for exposure of charged plate type detector
423+, for corona source, per se.

325 This subclass is indented under subclass 324. Subject matter wherein electrons or ions from the corona are deposited on an object resulting in a residual charge on the object and including means for or the step of moving the object during irradiation.

(1) Note. The resulting charge deposited on the object is generally uniform and for the purpose of producing a charged plate type detector.

SEE OR SEARCH THIS CLASS, SUBCLASS:
315.3, for exposure of charged plate type detector.

SEE OR SEARCH CLASS:
29, Metal Working, 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.

326 This subclass is indented under subclass 324. Subject matter wherein electrons or ions from the corona are deposited on an object resulting in a residual charge on the object.

(1) Note. See Note 1 and search notes to subclass 325.

328 This subclass is indented under the class definition. Subject matter which includes plural, identical radioactive sources or sample holders, a detecting station, means to position successively, one at a time, one of the sources or holders at the detecting station and means to detect the radioactive emissions from the source or holder at the detecting station.

SEE OR SEARCH CLASS:
193, Conveyors, Chutes, Skids, Guides, and Ways, subclasses 2+ for chutes, 35+ for rollerways and subclasses 38+ for skidways to transfer articles from one point to another.
198, Conveyors: Power-Driven, subclasses 20+ for article transfer devices.
221, Article Dispensing, subclass 1 for process for the separation of one or more articles at a time from an article source of supply.

329 This subclass is indented under the class definition. Subject matter which includes a source of radiation, a screen and a record having a pattern or a support for a record wherein the radia-

tion forms a radiation image of the pattern and (1) a light image of the radiation image is formed on the screen or (2) a light reversal image is formed on the screen, when illuminated and methods of using such means.

(1) Note. Included are devices which as a result of part (2) of the definition cause more contrast of image details on the screen when illuminated.

(2) Note. The screen is not restricted to a luminescent type as long as an image can be seen as a result of a radiation image incident upon the screen.

SEE OR SEARCH THIS CLASS, SUBCLASS:

271, for coded record readers wherein the reader gives a response to identify a code pattern.

316.1+, for methods and apparatus for recording infrared patterns from a infrared source by means of a screen and a recording member.

327.2, for methods and apparatus including a source with a recording detector which may utilize a screen in the production of a record.

330, for methods and apparatus for infrared pattern conversion to visible light images.

458.1+, for methods and apparatus for irradiating as luminophor generally.

483.1+, for luminescent devices, per se.

SEE OR SEARCH CLASS:

40, Card, Picture, or Sign Exhibiting, subclasses 361+ for film viewers generally.

348, Television, subclasses 744+ for television systems wherein the image is projected onto a screen.

353, Optics: Image Projectors, subclasses 1+ for image projectors generally.

355, Photocopying, subclasses 18+ and 78+ for methods and apparatus for photocopying by projection or contact printing.

359, Optics: Systems (Including Communication) and Elements, subclasses 369 and 400 for compound lens systems with viewing screens and 466+ for Stereoscopic viewers.

330 This subclass is indented under the class definition. Subject matter comprising means to convert an infrared radiation field into a visible light display of the relative intensity over the field.

SEE OR SEARCH THIS CLASS, SUBCLASS:

316.1+, for recording incident infrared radiation

338.1+, for infrared responsive electric signalling devices and methods.

472.1+, for infrared responsive nonelectric signalling devices.

SEE OR SEARCH CLASS:

348, Television, subclasses 164+ for infrared to visible imaging which includes television scanning.

331 This subclass is indented under subclass 330. Subject matter wherein the infrared conversion means comprises a liquid crystalline material in layer form having an optical property that is changed in the infrared image areas.

332 This subclass is indented under subclass 330. Subject matter wherein the infrared conversion means comprises a plurality of independently responsive infrared detectors in mosaic form each of which detects infrared radiation in a different portion of the infrared image.

(1) Note. The detectors may (a) change in appearance and are viewed directly or with the aid of an assisted optical system, (b) produce a corresponding image in an associated viewing means or (c) produce electrical signals to control a display device.

333 This subclass is indented under subclass 330. Subject matter wherein the infrared conversion means comprises an evacuated envelope having an infrared responsive input screen with (1) an output screen for visualizing an intensified image or (2) means for converting the infrared image to electrical signals to control a display device.

(1) Note. Devices under item (1) above include image intensifier tubes. Devices

under item (2) above include vidicon tubes and television cameras.

334 This subclass is indented under subclass 330. Subject matter wherein the infrared conversion means includes (1) means for moving the detector in faster fashion across the field of view or (2) optical means moving in faster fashion across the field of view for reflecting infrared radiation to a stationary detector.

335 This subclass is indented under the class definition. Subject matter including vessels transparent in whole or in part to permit visual observation of the interior and means establishing a supersaturated condition in a gas or liquid confined in the vessel to cause visible vapor or bubbles to form in response to an ionizing event or the passage of a particle therethrough.

336.1 INVISIBLE RADIANT ENERGY RESPONSIVE ELECTRIC SIGNALLING: This subclass is indented under the class definition. Subject matter which when subjected in whole or in part to invisible radiant energy produces between some two electrically accessible points an increase or decrease in electric potential difference or current flow.

(1) Note. The subject matter of this subclass and the subclasses indented hereunder includes means to convert invisible radiant energy to some other kind of energy which is then converted to an electrical signal. For example, means including a phosphorescent material that produces visible light in response to irradiation by invisible radiant energy combined with means producing an electrical signal in response to irradiation by the visible light will be found in subclasses 361+.

(2) Note. Subject matter responsive only to visible radiant energy or useful with both visible and invisible radiant energy is not classified here but in subclasses 200+ below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

200+, for subject matter responsive to visible radiant energy or useful with both visible and invisible radiant energy.

472.1+, for means which respond to invisible radiation but do not produce, or are not combined with means that produce, a corresponding electrical signal.

SEE OR SEARCH CLASS:

359, Optics: Systems (Including Communication) and Elements, subclasses 109+ for light wave communications.

378, X-Ray or Gamma Ray Systems or Devices, appropriate subclasses for X-ray devices of this type.

336.2 Superconducting type: This subclass is indented under subclass 336.1. Subject matter including material having a substantial decrease in electric resistance near absolute zero.

SEE OR SEARCH CLASS:

374, Thermal Measuring and Testing, subclass 176 for temperature measurement with a superconductive sensor.

337 This subclass is indented under subclass 336. Subject matter having means or steps for thermally exciting to luminescence a material that is or has been exposed to invisible radiation in combination with means responsive to the luminescence to produce an electric signal.

SEE OR SEARCH THIS CLASS, SUBCLASS:

361+, for luminophors in combination with luminescence responsive electric signalling means without heating.

483.1+, for luminophors, per se.

338.1 Infrared responsive: This subclass is indented under subclass 336.1. Subject matter wherein the signalling means is responsive to electromagnetic radiation having a wave-length in the range of 750 nanometers to 1 millimeter, i.e., infrared.

(1) Note. The subject matter of this subclass and the subclasses indented hereunder does not include heat or temperature responsive means, per se. But these subclasses do include means to convert infrared radiation to heat combined with heat or temperature responsive electric

signalling means responsive to such converted radiations.

SEE OR SEARCH CLASS:
136, Batteries: Thermoelectric and Photoelectric, subclasses 224+ for thermocouples, per se.
340, Communications: Electrical, subclass 600 for radiant energy conditions indicators.
374, Thermal Measuring and Testing, subclasses 100+ for temperature Measurement.

338.2 Ferroelectric, ferromagnetic, photomagnetic types:
This subclass is indented under subclass 338.1. Subject matter including a material in which (a) the direction of polarization can be reversed by an electric or magnetic field or (b) in which the magnetic permeability can be changed by infrared radiation.

(1) Note. Ferroelectric materials are pyroelectric as well.

SEE OR SEARCH THIS CLASS, SUBCLASS:
338.3, for pyroelectric infrared detectors.

SEE OR SEARCH CLASS:
374, Thermal Measuring and Testing, subclasses 176+ for temperature measurement with a ferroelectric or ferromagnetic sensor.

338.3 Pyroelectric type:
This subclass is indented under subclass 338.1. Subject matter including a material wherein a change in the intensity of absorbed incident radiation produces an electric signal.

SEE OR SEARCH THIS CLASS, SUBCLASS:
332+, for infrared-to-visible imaging with a pyroelectric target.

SEE OR SEARCH CLASS:
136, Batteries: Thermoelectric and Photoelectric, subclass 213 for radiation pyrometers.
313, Electric Lamp and Discharge Devices, subclass 388 for cathode ray tubes with a pyroelectric target.

338.4 Semiconducting type:
This subclass is indented under subclass 338.1. Subject matter including material having a resistivity intermediate that of metals and insulators.

SEE OR SEARCH THIS CLASS, SUBCLASS:
332, for infrared-to-visible imaging with a semiconducting target.
370.01+, for semiconducting detectors, per se.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 10, 11, 21, 53-56, 113-118, 184-189, 225-234, 257, 258, 290-294, and 414-466 for radiation-sensitive active semiconductors devices, and subclasses 613+ for active semiconductor devices containing Group II-VI compounds.
374, Thermal Measuring and Testing, subclass 178 for temperature measurement with a semiconductor.

338.5 With means to analyze uncontained fluent material:
This subclass is indented under subclass 338.1. Subject matter having means to detect infrared radiation emanating from the material.

(1) Note. The emanation from the material may be natural emission or radiation modified or caused by the material as through reflection, resonant absorption, reradiation and the like.

SEE OR SEARCH THIS CLASS, SUBCLASS:
339.07, and 339.08, for infrared spectrometry.
343, and 373, for transmission-testing of contained material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 317+ for spectroscopy with sample excitation using light, and subclasses 436+ for transmission or absorption testing of a fluent material.

339.01 With selection of plural discrete wavelengths or bands:
This subclass is indented under subclass 338.1. Subject matter having means to isolate from an infrared beam two or more of its components having different wavelengths or ranges of wavelengths and to direct the components simultaneously or at different times to the responsive means and methods involving the use of such means.

(1) Note. The subject matter of this subclass includes "infrared spectrometry" which includes, in addition to the means of the subclass, a sample of a material to be tested positioned in the infrared beam either before or after the selection means. The subject matter of this subclass does not include signalling means that have plural wavelengths or bands wherein only one wavelength or band is in the infrared region of the spectrum.

SEE OR SEARCH THIS CLASS, SUBCLASS:
370.06, for systems with means to differentiate between different wavelengths or types of invisible radiation.
503.1, for a radiation source for this class and a filter for the radiation source, the filter being an absorption filter or a prism or diffraction grating type filter.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 300+ for spectroscopic apparatus using visible light and dispersive devices; subclasses 319+ for spectrophotometers; and subclasses 405, 406, and 407 for spectroscopic apparatus using visible light and dispersive devices, subclasses 85+ for plural spectrophotometers, subclasses 96+ for spectrophotometers, per se, and subclasses 176, 177, and 178 for spectrophotometers of the plural filter type where only visible light tests are performed.

339.02 Including detector array:
This subclass is indented under subclass 339.01. Subject matter wherein infrared detection means comprise a plurality of independently responsive infrared detectors.

SEE OR SEARCH THIS CLASS, SUBCLASS:
332, for infrared-to-visible imaging detector array.
349, for plural infrared responsive signaling means not having plural discrete wavelengths or bands.

339.03 Including temperature control means:
This subclass is indented under subclass 339.01. Subject matter containing means to adjust or maintain the temperature of a signalling means, of a component thereof, or of a sample under analysis.

(1) Note. A sample is defined as a solid material or object or a fluent material (i.e., liquid or gas) that is being analyzed to determine particular properties or attributes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
352, for temperature-controlled infrared detectors.
370.15, for temperature control of semiconductor systems.

SEE OR SEARCH CLASS:
62, Refrigeration, subclass 514 for detector cooling in general.

339.04 Including temperature determining means:
This subclass is indented under subclass 339.01. Subject matter containing means to measure the temperature of a sample under analysis.

339.05 With additional noninfrared wavelengths:
This subclass is indented under subclass 339.01. Subject matter wherein the signalling means utilize or sense electromagnetic radiation having wavelengths outside the infrared region of the spectrum in addition to the plural wavelengths or bands within the infrared region.

339.06 With radiation source:
This subclass is indented under subclass 339.01. Subject matter which includes irradiation of a sample by infrared radiation and detection of the emitted radiation from the sample or the radiation after transmission or reflection from the sample.

SEE OR SEARCH THIS CLASS, SUBCLASS:
341.8+, for methods involving irradiating samples.

339.07 Including spectrometer or spectrophotometer:
This subclass is indented under subclass 339.06. Subject matter wherein a spectrometer or a spectrophotometer is used to detect infrared radiation that has interacted with a sample.

(1) Note. A spectrometer is an instrument that determines the frequency distribution of the energy generated by a source and displays all components simultaneously. A spectrophotometer is an instrument that detects and measures the spectral transmittance, reflectance, or emittance of a sample for comparing or determining properties as a function of wavelength.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 319+ for spectrophotometers, and subclasses 326+ for spectrometers.

339.08 Including Fourier transform infrared spectrometry:
This subclass is indented under subclass 339.07. Subject matter wherein the detection process includes performing a Fourier transform on the detected signal.

(1) Note. A Fourier transform is a mathematical operation which decomposes a time varying signal into its complex frequency components (amplitude and the phase or real and imaginary components).

339.09 With calibration steps in measurement process:
This subclass is indented under subclass 339.06. Subject matter wherein the process of quantifying a property or attribute of a sample includes establishing a reference level or scale.

(1) Note. References are established by normalizing the measurement of interest with a measurement from a reference wavelength or by measuring the response of the system under known conditions (e.g. first measuring fixed samples).

SEE OR SEARCH THIS CLASS, SUBCLASS:
252.1, for calibration or standardization methods.

339.1 Determining moisture content:
This subclass is indented under subclass 339.06. Subject matter wherein means are particularly adapted to determine the presence or quantity of water in a sample.

SEE OR SEARCH THIS CLASS, SUBCLASS:
390.05, for neutron responsive moisture determining systems.

339.11 Measuring infrared radiation reflected from sample:
This subclass is indented under subclass 339.06. Subject matter wherein detection means are positioned to receive infrared radiation which has been reflected by a sample.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 445+ for light reflection systems in general.

339.12 Using sample absorption for chemical composition analysis:
This subclass is indented under subclass 339.06. Subject matter wherein chemical constituents or properties of a sample are determined by detecting and analyzing infrared radiation that has interacted with the sample.

339.13 With gaseous sample:
This subclass is indented under subclass 339.12. Subject matter wherein a sample is in a gaseous state.

SEE OR SEARCH THIS CLASS, SUBCLASS:
343, for infrared responsive systems with fluid confining means between the source and detector.

339.14 Detecting infrared emissive objects:
This subclass is indented under subclass 339.01. Subject matter which includes the detection of an infrared radiant energy emitting object and indication of the presence, location, or direction of the energy emitting object.

SEE OR SEARCH THIS CLASS, SUBCLASS:
342, for methods involving location of infrared emissive objects.

339.15 Sensing flame or explosion:
This subclass is indented under subclass 339.14. Subject matter wherein the detection means sense infrared wavelengths emitted by the combustion of solids or gases.

SEE OR SEARCH CLASS:
340, Communication: Electrical, subclasses 578+ for flame responsive indication systems.

340 This subclass is indented under subclass 338.1. Subject matter which includes methods of detecting infrared radiation where not elsewhere provided.

SEE OR SEARCH THIS CLASS, SUBCLASS:
341.1+, for methods involving electric signalling where the detected radiation is first modified by material or an object before detection.
342, for methods involving the locating of objects.

341.1 With irradiation or heating of object or material:
This subclass is indented under subclass 340. Subject matter comprising methods which include the irradiation of a material or an object by infrared radiation, or the heating of a material or an object to emit infrared radiation, and the detection of the radiation from the material or object.

341.2 Including probe:
This subclass is indented under subclass 341.1. Subject matter wherein an elongated element (e.g., an optical fiber) is used to irradiate the material or object with infrared radiation or to detect infrared radiation from the material or object.

SEE OR SEARCH THIS CLASS, SUBCLASS:
227.11, for optical probes using visible radiation.

341.3 Including polarizing means:
This subclass is indented under subclass 341.1. Subject matter having means to polarize infrared radiation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
225, for optical or pre-photocell systems with means for polarizing visible light.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 364+ for polarized light examination.
359, Optics: Systems (Including Communication) and Elements, subclasses 483+ for polarizers, per se.

341.4 With semiconductor sample:
This subclass is indented under subclass 341.1. Subject matter wherein the object irradiated or heated is a material having resistivity intermediate that of metals and insulators (i.e., a semiconductor).

341.5 With calibration:
This subclass is indented under subclass 341.1. Subject matter wherein the process includes establishing a reference level or scale based on detected infrared radiation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

252.1, for calibration or standardization methods with sources of invisible radiation.

339.09, for calibration with selection of plural discrete infrared wavelengths or bands.

341.6 Heating of object or material:

This subclass is indented under subclass 341.1. Subject matter wherein the material or object is heated causing the material or object to emit infrared radiation.

SEE OR SEARCH CLASS:

374, Thermal Measuring and Testing, subclass 5 for heating of specimen for detection of leak or flaw.

341.7 With multiple sources:

This subclass is indented under subclass 341.1. Subject matter wherein the material or object is irradiated with infrared radiation from two or more distinct sources.

341.8 Measuring infrared radiation reflected from sample:

This subclass is indented under subclass 341.1. Subject matter wherein detection means are positioned to receive infrared radiation which has been reflected by the material or object.

SEE OR SEARCH THIS CLASS, SUBCLASS:

339.11, for measuring infrared radiation reflected from samples with selection of plural discrete wavelengths or bands.

SEE OR SEARCH CLASS:

356, Optics: Measuring and Testing, subclasses 445+ for light reflection systems in general.

342 Subject matter under 340 which includes the detection of an infrared radiant energy emitting object and the indication of the presence, location or direction of the energy emitting object.

(1) Note. An object includes planets, infrared sources and man made objects.

343 This subclass is indented under subclass 338.1. Subject matter having a source of infrared radiation in addition to the signalling means and means to confine a gas, fluid or fluid-like material between the source and the signalling means so that the signalling means responds to radiation, from the source, that passes through the material.

SEE OR SEARCH CLASS:

137, Fluid Handling, subclasses 2+ for processes using IR transmission tests to control the concentration of a mixture of fluent materials and subclass 93 for corresponding apparatus.

202, Distillation: Apparatus, subclass 40 for automatic control of distillation apparatus by means of infrared absorption test.

260, Chemistry of Carbon Compounds, subclass 683.4 for control of concentrations by IR transmission tests.

344 This subclass is indented under subclass 343. Subject matter having two or more signalling means spaced along a single path of radiation from the source.

(1) Note. Expansible gas responsive means having two chambers and a common deformable wall which moves as a result of the difference in pressures between the two chambers and gives an electrical signal is included in this subclass if both chambers are in the path of the radiation.

345 This subclass is indented under subclass 343. Subject matter wherein the source of infrared radiation forms two or more beams with at least one beam being transmitted through the contained material, and two or more electric signalling means, one responsive to radiation transmitted through the contained material and at least one in the path of one of the other beams.

SEE OR SEARCH THIS CLASS, SUBCLASS:

252.1, for methods of standardizing the apparatus of this subclass type.

339.01+, for means forming two or more beams of different wavelengths or bands which may be combined with a con-

tained fluent and a detector in two or more of the radiation paths.

346 This subclass is indented under subclass 345. Subject matter wherein the signalling means includes a means that absorbs the incident infrared radiation and converts it to heat combined with electrical means having some electrical parameter (capacitance, resistance, etc.), that varies in response to the heat.

347 This subclass is indented under subclass 338.1. Subject matter having means to change the path of the infrared radiation from the source to the signalling means; or to cause the radiation to converge, the orientation or position of the means being changeable with respect to some part of the path or signalling means.

348 This subclass is indented under subclass 347. Subject matter having means responsive to the radiant energy responsive means to change or maintain constant the orientation of the deflector or focussing means.

349 This subclass is indented under subclass 338.1. Subject matter having two or more infrared responsive electric signalling means.

350 This subclass is indented under subclass 349. Subject matter having means to change at regular intervals some characteristic of the infrared radiation in the path of the radiation from the source to the signalling means.

351 This subclass is indented under subclass 338.1. Subject matter having means to change at regular intervals some characteristic of the infrared radiation in the path of the radiation from the source to the signalling means.

352 This subclass is indented under subclass 338.1. Subject matter having means to conduct heat to or from at least some part of the infrared responsive electric signalling means.

353 This subclass is indented under subclass 338.1. Subject matter having means to change the path of the infrared radiation from its source to the signalling means or to cause the radiation to converge.

354.1 Signalling means controls incident radiation:
This subclass is indented under subclass 336.1. Subject matter including means responsive to the electric signalling means to vary or maintain constant some characteristic of the invisible radiation impinging upon the signalling means.

(1) Note. Example of means of this subclass type include means to vary the intensity, angle of incidence or wavelength of the impinging radiation.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 8, 97 and 108 for X-ray devices of this type.

356.1 Flow metering:
This subclass is indented under subclass 336.1. Subject matter which includes a passageway containing moving material or a substance controlled by the moving material, a radiation source which may be the material itself, a detector responsive to the radiation from the source after passage of the radiation through the material or substance or the radiation from the material, wherein the detection forms the basis for a rate of flow determination and methods corresponding to the apparatus.

SEE OR SEARCH THIS CLASS, SUBCLASS:
258, for testing of wells involving the testing for leakage of fluids into or out of a well.
259+, for the use of tracer material in a well to test for leakage into or out of a well.
302+, for rate of flow metering using tracer materials.
306+, for rate of flow testing using charge particles.
359.1, for fluent material level tests.
432+, for rate of flow testing of confined moving fluids using a nonelectric detector.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclass 51 for X-ray devices which may include flow metering.

356.2 Using radioactive tracer:

This subclass is indented under subclass 356.1. Subject matter wherein the material is or includes a radioactive substance.

SEE OR SEARCH THIS CLASS, SUBCLASS:

303, for radioactive tracer methods.

357.1 Fluent material level signalling:

This subclass is indented under subclass 336.1. Subject matter which includes a body of fluent material, a radiant energy source, and a detector responsive to the source arranged so that the body of fluent material is located in the radiation path between the source and detector or the body of fluent material supports either the source or detector, wherein the detector produces an output representative of the height or depth of the body of fluent material and methods corresponding to the apparatus.

SEE OR SEARCH THIS CLASS, SUBCLASS:

306+, for containing fluent material level signalling where charged particles are used to sense the level of the material.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 290+ for liquid level or depth gauges not using invisible light.

116, Signals and Indicators, subclasses 109+ and 227+ for mechanical liquid level indicators.

137, Fluid Handling, subclasses 386+ for liquid level responsive or maintaining system.

340, Communications: Electrical, subclasses 612+ for fluent or pulverized material level not using invisible light.

378, X-Ray or Gamma Ray Systems or Devices, subclass 52 for X-ray type level measuring.

358.1 With means to inspect passive solid objects:

This subclass is indented under subclass 336.1. Subject matter having, in addition to an electric signalling means, a source of invisible radiant energy and means to support, position, or accommodate a material in the solid state in the radiation path from the source to the signalling means, the signalling means responding to radiation from the source passing through the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

306+, for means to inspect solid objects wherein the radiation is comprised of charged particles.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, appropriate subclasses for X-ray devices of this type.

359.1 Rectilinearly moving object:

This subclass is indented under subclass 358.1. Subject matter wherein the object is radiated by a source while the object is continuously moving in a straight line.

360.1 With relative movement means:

This subclass is indented under subclass 358.1. Subject matter having movement conveying means to move either the source, signalling means, object or object accommodating means with respect to the other means.

361 This subclass is indented under subclass 336. Subject matter in which the means that produces the change in electric potential difference or current flow is a photodetector responsive to incident visible light emitted from a means which passively converts the energy of incident invisible radiation into visible radiation.

(1) Note. The means that produces the change in electrical potential difference or current flow is usually a photocell, photomutiplier or iconoscope.

(2) Note. Included in this subclass and the subclasses indented hereunder are means for producing and detecting Cerenkov radiation.

(3) Note. The luminophor may be a luminescent material to be tested by invisible radiation or it may be a means to test incident invisible radiation. In either case, the response of the luminiphor is indicated electrically.

SEE OR SEARCH THIS CLASS, SUBCLASS:

200+, for visible light responsive electric signalling means without an invisible-to-visible radiation converting luminophor.

389, for photoemmissive detectors without a luminophor invisible-to-visible converter.

458.1+, for methods and means for irradiating luminophors, per se.

483.1+, for luminescent means for signalling by its luminescence, per se, the incidence of invisible radiation.

SEE OR SEARCH CLASS:

356, Optics: Measuring and Testing, appropriate subclasses for light responsive photocell detectors, see particularly the class definition, Lines With Other Classes, "Fluorescence and Phosphorescence Testing" and "Lasers and Resonance Radiation" and the notes to subclasses 199, 201 and 204.

362 This subclass is indented under subclass 361. Subject matter comprising processes including the signalling of incident invisible radiation by the electrical detection of light from an exposed luminophor.

363.01 With radiant energy source:
This subclass is indented under subclass 361. Subject matter in combination with means which irradiates either the luminophor or the photodetector or both.

(1) Note. The means which irradiates the photodetector may be a source of visible light.

(2) Note. Means which generate invisible radiation as a result of irradiation by another source of radiation is included in this subclass, the first means being the source which the detector is responsive to.

363.02 Body scanner or camera:
This subclass is indented under subclass 363.01. Subject matter in combination with irradiating means to form a visible image of the radiation within the body.

(1) Note. A body includes human beings and animals.

(2) Note. The photodetector may move or it may remain stationary with respect to the body.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 4+ and subclasses 21+ for tomographic body scanners with an external X-ray or Gamma Ray source, subclasses 63+ for X-ray imaging combined with non-X-ray imaging and subclass 146 for scanners with an external X-ray or Gamma Ray source.

363.03 With positron source:
This subclass is indented under subclass 363.02. Subject matter in which the means which irradiates is a source of particles with a mass the same as that of the electron, but with a positive charge.

363.04 Emission tomography:
This subclass is indented under subclass 363.02. Subject matter in which the image-forming means produces an image of a cross-section of the body from the radiation emitted within the body.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 4+ and subclasses 21+ for tomography with an external X-ray source.

363.05 With detector support:
This subclass is indented under subclass 363.04. Subject matter including structure to support or move the photodetector.

(1) Note. The detectors of a tomography apparatus are moved in a circle about an

axis perpendicular to the cross-section of the body.

SEE OR SEARCH THIS CLASS, SUBCLASS:
363.08, for detector support of body scanners or cameras in general.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 189+ for X-ray nonphotographic detector supports, and subclasses 193+ for X-ray sources support.

363.06 Using coded aperture:
This subclass is indented under subclass 363.02. Subject matter including means to spatially modulate radiation prior to its impinging upon the photodetector.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclass 2 for special modulation of X-ray prior to impingement upon an object.

363.07 With distortion correction:
This subclass is indented under subclass 363.02. Subject matter in combination with means to process the electric current produced by the photodetector to reduce distortion in the visible image formed.

SEE OR SEARCH THIS CLASS, SUBCLASS:
369, for post-detection circuitry in general.

SEE OR SEARCH CLASS:
600, Surgery, subclasses 407 through 480 for medical diagnostic testing with detection of nuclear, electromagnetic, or ultrasonic radiation.

363.08 With detector support:
This subclass is indented under subclass 363.02. Subject matter including structure to support or move the photodetector irradiating means.

SEE OR SEARCH THIS CLASS, SUBCLASS:
363.05, for detector support in emission tomography.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 189+ for X-ray nonphotographic detector supports, and subclasses 193+ for X-ray source supports.

363.09 With calibration:
This subclass is indented under subclass 363.02. Subject matter including means to establish a reference indication of the invisible radiation or its level.

SEE OR SEARCH THIS CLASS, SUBCLASS:
252.1, for calibrating and standardizing methods in general.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclass 207 for calibration of X-ray devices.
702, Data Processing: Measuring, Calibrating, or Testing, subclasses 85 through 107 for a data processing calibration or correction system.

363.1 With a collimator:
This subclass is indented under subclass 363.02. Subject matter in combination with means to control the shape, size, axial direction or focal length of radiation reaching the luminophor.

SEE OR SEARCH THIS CLASS, SUBCLASS:
505.1, for other radiation controlling means.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 147+ for collimators with a radiation source outside the body.

364 Subject matter under subclasses 363.01+ in which the means that irradiates is either a fluid or gas or particles suspended in either a fluid or gas medium and means are provided to either conduct or hold the fluent source.

(1) Note. The means to hold the fluid may be, for example, a receptacle or an absorbent.

365 Subject matter under subclasses 363.01+ wherein there is at least one source of electromagnetic radiation in the ultraviolet region which irradiates either the luminophor or the photo detector or both.

366 This subclass is indented under subclass 361. Subject matter in which there are two or more means each of which produces an electric potential difference or a current flow in response to incident radiation.

(1) Note. The subject matter of this subclass may comprise either two or more luminophor - photodetector pairs or two or more photodetectors irradiated by visible light from any number of luminophors.

SEE OR SEARCH THIS CLASS, SUBCLASS:
367, for two or more luminophors irradiating only one photodetector.

367 This subclass is indented under subclass 361. Subject matter including two or more separate passive means that convert incident invisible radiation into visible radiation or including diverse passive means that convert incident invisible radiation into visible radiation.

(1) Note. The diverse passive means may include a crystal of dissimilar materials both of which luminesce but in response to different incident radiations.

368 This subclass is indented under subclass 361. Subject matter in combination with means affecting the transmission of visible light between the liminophor and the light detector.

(1) Note. Subject matter of this subclass includes optical means between the luminophor and the light detector other than the atmosphere or a window (optical flat) which is not specifically included to attenuate, filter, focus or direct light. Included, for example, are light pipes, filters, shutters, lenses and reflectors.

369 This subclass is indented under subclass 361. Subject matter in combination with electric circuit means which is energized or controlled by the electric current produced by the photodetector.

370.01 Semiconductor system:
This subclass is indented under subclass 336.1. Subject matter wherein the invisible radiant energy responsive electric signal generating means, i.e., detection means, is made of a material having a resistivity intermediate that of metals and insulators, and means are provides for using or controlling the electric signal or for modifying the invisible radiant energy input signal.

(1) Note. This subclass and those indented thereunder do not provide for claims which only recite the structure of a photocell, per se. Photocells, per se, are classified elsewhere.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 10, 11, 21, 53-56, 113-118, 184-189, 225-234, 257, 258, 290-294, and 414-466 for invisible radiation-sensitive active semiconductors devices.

370.02 Alpha particle detection system:
This subclass is indented under subclass 370.01. Subject matter wherein the system contains detection means to generate the electric signal in response to helium nuclei impingent thereupon.

SEE OR SEARCH THIS CLASS, SUBCLASS:
253, for alpha detectors to detect radon gas.
374+, for alpha detection with gas discharge devices.
472.1, for alpha detectors to detect radon gas.

370.03 Fission fragment/fissionable isotope detection system:
This subclass is indented under subclass 370.01. Subject matter wherein the system contains detection means to generate an electric signal in response to a fission fragment or fissionable isotope impingent thereupon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

255, for geological testing with sampling for the presence of fissionable isotopes.

269.1+, for geological testing with a radiation source for the presence of fissionable isotopes.

390.04, for composition analysis using a neutron detector.

SEE OR SEARCH CLASS:

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclass 253 for reactor fuel element leak detection by detection of fission products external to the fuel element; and subclass 257 for reactor fuel assay.

370.04 Self-powered system:

This subclass is indented under subclass 370.01. Subject matter wherein the detection means generates the signal without any electrical power supply connected thereto.

SEE OR SEARCH THIS CLASS, SUBCLASS:

370.04, for semiconductor neutron detectors that are not self-powered.

390.01+, for neutron detectors in general.

SEE OR SEARCH CLASS:

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 254+ for reactor flux monitors.

370.05 Neutron detection system:

This subclass is indented under subclass 370.01. Subject matter wherein the system contains detection means to generate an electric signal in response to a neutron impingent thereupon.

SEE OR SEARCH THIS CLASS, SUBCLASS:

370.04, for self-powered semiconductor neutron detectors.

390.01+, for neutron detectors with an electric output.

472.1+, for detectors with a nonelectric output.

370.06 Discrimination-type system:

This subclass is indented under subclass 370.01. Subject matter wherein the system contains means to differentiate between different types of invisible radiant energy impingent thereupon or between different output signal characteristics.

SEE OR SEARCH THIS CLASS, SUBCLASS:

339.07, and 339.08, for infraded spectrometers.

390.07+, for neutron spectrum analysis.

370.07 Dose or dose rate measurement:

This subclass is indented under subclass 370.01. Subject matter wherein the system includes means to determine the amount of radiant energy incident on the detection means, including with respect to time.

SEE OR SEARCH THIS CLASS, SUBCLASS:

374+, for gas discharge-type dosimeters and dose rate monitors.

388, for gas discharge-type devices with an indicator.

390.01, for neutron dose rate monitors in general.

390.03, for neutron dosimeters.

392, for neutron dose rate monitors with an indicator.

475.2+, for photographic-type dosimeters.

SEE OR SEARCH CLASS:

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 254+ for reactor flux monitors.

370.08 Imaging system:

This subclass is indented under subclass 370.01. Subject matter wherein the system contains means to form an image of an object which is directly or indirectly illuminating the radiant energy detection means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

332, for infrared-to-visible imaging with semiconductor detectors.

338.4, for infrared-responsive semiconductor detectors.

349, for infrared-responsive detectors with plural signalling means.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 10, 11, 21, 53-56, 113-118, 184-189, 225-234, 257, 258, 290-294, and 414-466 for invisible radiation-sensitive active semiconductors devices.

348, Television, subclasses 164+ for infrared responsive television cameras.

370.09 X-ray or gamma-ray system:

This subclass is indented under subclass 370.01. Subject matter wherein the system includes an X-ray or gamma ray source of radiant energy to be incident on the radiant energy detection means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

363.2+, for gamma-ray imaging devices including a scintillator.

367, for gamma-ray imaging devices including plural scintillators.

370.11, for radiation-sensitive scintillators with a semiconductor to detect visible light therefrom.

385.1, for X-ray and gamma-ray imaging with a gas-discharge detector.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 10, 11, 53-56, 225+, 414, and 428-430 for active semiconductors devices responsive to X-rays or gamma rays.

378, X-Ray or Gamma-Ray Systems or Devices, subclasses 98.2+ for circuits for X-ray responsive television cameras.

370.1 Position sensitive detection system:

This subclass is indented under subclass 370.01. Subject matter wherein the system contains means to produce an electric signal which indicates the position of the radiant energy on the detection means or the position of the source of the radiant energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:

385.1+, for position-sensitive gas discharge detectors.

390.12, for position-sensitive neutron detectors.

370.11 Scintillation system:

This subclass is indented under subclass 370.01. Subject matter further including a luminophor which converts energy incident thereupon (e.g., electrons, X-rays, etc.) into radiant energy to which the detection means is responsive.

SEE OR SEARCH THIS CLASS, SUBCLASS:

363.2+, for gamma-ray imaging devices including a scintillator.

367, for gamma-ray imaging devices including plural scintillators.

370.09, for X-ray and gamma-ray imaging with a semiconductor.

370.12 Of material other than germanium, diamond, or silicon:

This subclass is indented under subclass 370.01. Subject matter wherein the detection means is an uncommonly used material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

370.13, for semiconductor detectors including mixtures of cadmium telluride.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses, especially subclasses 19, 22, 40, 42, 43, 63, 65, 76-78, 102, 103, 188, 189, 200, 201, 289, 295, 607-612, 613-616, 915, and 916 for particular active region materials.

370.13 Containing cadmium telluride:

This subclass is indented under subclass 370.12. Subject matter wherein the detection means includes Cadmium Telluride.

SEE OR SEARCH THIS CLASS, SUBCLASS:
338.4, for infrared-responsive semiconducting detectors including CdTe.

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclass 614 for active semiconductor devices containing group II-VI compounds.

370.14 Particular detection structure (e.g., MOS, PIN):
This subclass is indented under subclass 370.01. Subject matter wherein the detection means has a specified semiconductor structural arrangement (e.g., a light responsive field effect transistor, or P-I-N diode, etc.).

SEE OR SEARCH CLASS:
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), the entire class, for active solid-state semiconductor devices, per se, which have particular structure.

370.15 Temperature control or compensation system:
This subclass is indented under subclass 370.02. Subject matter further including means to adjust or maintain the temperature of the system or of a component thereof.

SEE OR SEARCH THIS CLASS, SUBCLASS:
352, for cooled infrared detectors.

SEE OR SEARCH CLASS:
62, Refrigeration, subclass 514 for detector cooling in general.
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 468, 625, 675, 706, 707, and 712-722 for temperature controlled devices.

371 This subclass is indented under subclass 370.1. Subject matter including processes employing semiconductor detection means to produce an electrical signal.

372 This subclass is indented under subclass 336.1. Subject matter wherein the radiation responsive means responds to ultraviolet light.

373 This subclass is indented under subclass 372. Subject matter having a source of ultraviolet radiation in addition to the signalling means and means to confine a gas, fluid or fluid-like material between the source and the signalling means so that the signalling means responds to radiation from the source, that passes through the material.

374 This subclass is indented under subclass 336.1. Subject matter wherein the two electrically accessible points are separated by an ionizable gas, which gas when subjected to invisible radiation ionizes and conducts a current from one point to the other, the current being the signal.

SEE OR SEARCH CLASS:
313, Electric Lamp and Discharge Devices, subclass 93 for radiant energy responsive gas discharge devices, per se.
315, Electric Lamp and Discharge Devices: Systems, subclass 149 for systems for energizing discharge devices that are responsive to radiant energy.
324, Electricity: Measuring and Testing, subclasses 459+ for testing for other than radiation by ionization means.

375 This subclass is indented under subclass 374. Subject matter which includes methods corresponding to the apparatus which utilize a radiant energy responsive gas discharge device.

376 This subclass is indented under subclass 374. Subject including two electrostatically charged relatively movable members, at least one of which is electrically connected to at least one of the electrodes, the discharge of which cause one of the members to be deflected with respect to the other, thus producing a visible indication of ionizing radiant energy.

SEE OR SEARCH CLASS:
324, Electricity: Measuring and Testing, subclass 109 for electroscopes, per se.

377 This subclass is indented under subclass 376. Subject matter combined with means for converting mechanical energy to electric energy and means electrically connecting said converting means to the relatively movable members to transfer electric charge thereto.

(1) Note. The converting means of this subclass may include, for example, dynamo - electric generators, electrostatic generators or such electroscopes as the pith - ball type which are shaken to electrostatically charge the balls.

378 This subclass is indented under subclass 376. Subject matter with a capacitor or polarizable dielectric electrically connected to at least one of the relatively movable members.

(1) Note. The subject matter of this subclass includes, for example, electrets in combination with electroscopic indicators.

379 This subclass is indented under subclass 374. Subject matter combined with means to move or permit movement of gas to, through, or away from the space between the electrodes.

(1) Note. Vapors as well as gases are used to ionize the space between the electrodes of the device.

380 This subclass is indented under subclass 379. Subject matter wherein the gas supplied to the electrodes emits, spontaneously, nuclear particulate or electromagnetic energy or has entrained in it other gases or fluent-like materials that emit spontaneously nuclear particulate or electromagnetic energy.

381 This subclass is indented under subclass 379. Subject matter in combination with means to ionize the gas between the electrodes comprising a material that emits, spontaneously nuclear particulate or electromagnetic energy.

382 This subclass is indented under subclass 374. Subject matter including a radioactive material or a source of electromagnetic or particulate radiation which detaches electrons from the molecules of the gas between the electrodes.

(1) Note. The means to ionize the gas may be contained within the gas itself, such as radioactive dust or may be external to it.

(2) Note. Not considered a means to ionize the gas is a material, e.g., comprising the container of the gas, which when irradiated, itself gives off ions or some other radiation which ionizes the gas. The means to ionize the gas in the example would be the means that irradiates the container.

SEE OR SEARCH CLASS:

324, Electricity: Measuring and Testing, subclasses 459+ for electrical testing by ionizing, without irradiation.

383 This subclass is indented under subclass 382. Subject matter wherein the means to ionize the gas is another fluid-like material that emits invisible radiant energy, or wherein the means to ionize the gas comprises some other source of invisible radiation and there is provided some means to contain or otherwise accommodate between the source and the gas discharge device a gas, fluid or fluid-like material through which the radiation from the source passes to the gas discharge device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

379+, for means to supply a radioactive gas to the space between the electrodes of the gas discharge device.

384+, for solid radioactive means to ionize the ionizable gas.

384 This subclass is indented under subclass 382. Subject matter wherein the means to ionize the gas is a material that emits spontaneously, invisible nuclear particulate or electromagnetic energy.

385.1 This subclass is indented under subclass 374. Plural chambers or three or more electrodes: Subject matter wherein there are more than two electrically independent, electrically accessible points or wherein the gas molecules between the electrically accessible points are prevented from free movement between the points by a wall or other barrier.

385.2 Spark chambers:
This subclass is indented under subclass 385.1. Subject matter wherein incoming radiant energy ionizes the gas molecules to trigger a spark between the electrically independent, electrically accessible points.

(1) Note. The position of the spark corresponds to the position of the ionizing event.

SEE OR SEARCH THIS CLASS, SUBCLASS:
385.1, for multiwire, position-sensitive detectors.
390.12, for position-sensitive neutron detectors.

386 This subclass is indented under subclass 374. Subject matter combined with means to establish an electric potential difference between the electrically accessible points of the gas discharge tube, which means changes the value of the electric potential difference at random intervals of time.

(1) Note. The means of this subclass may change the bias voltage in response to a discharge in the gas device due to impinging radiation for the purpose of quenching the discharge. Since the time intervals between ionizing events is random the biasing means varying in response to such events is considered periodic.

387 This subclass is indented under subclass 374. Subject matter combined with means to establish a potential difference between the two electrically accessible points which potential difference varies at equal intervals of time.

(1) Note. The periodic bias supply of this subclass functions, for example, to quench the discharge in the gas device.

388 This subclass is indented under subclass 374. Subject matter combined with perceptible means to signal the presence or amount of radiation impinging upon the radiant energy responsive gas discharge device.

SEE OR SEARCH THIS CLASS, SUBCLASS:
376+, for a radiant energy responsive gas discharge device combined with an electroscopis indicator.

389 This subclass is indented under subclass 336.1. Subject matter wherein the radiant energy responsive means is electrically charged by incident radiation either by retention if incident charged particles or by means of the incident radiation raising the energy level of molecules in the signalling device sufficiently enough to produce free electrons.

(1) Note. This is the residual locus for all radiation responsive signalling means including a device which is ionized by impinging radiation.

SEE OR SEARCH THIS CLASS, SUBCLASS:
361+, for means which emit light upon ionizing events which light is photoelectrically detected.
374+, for gas or vapor means rendered conductive by ionizing radiation.

390.01 Neutron responsive means:
This subclass is indented under subclass 336.1. Subject matter which produces a change in electric potential differential or current flow when subjected to particles with a mass approximately the same as that of a proton but with no electric charge.

SEE OR SEARCH THIS CLASS, SUBCLASS:
370.04, for self-powered semiconductor detectors which may be neutron-responsive.
370.05, for semiconductor-type neutron detectors.

390.02 Radiographic analysis:
This subclass is indented under subclass 390.01. Subject matter in combination with means to form a visible image of neutrons modified by an object.

SEE OR SEARCH THIS CLASS, SUBCLASS:

213, for light amplifiers with vacuum tube circuits.

363.02, for imaging with a luminophor-containing detector of a radioisotope source within a body.

370.08+, for radiant energy imaging using semiconductor detectors.

385.1+, for imaging using a gas discharge detector.

475.2+, for photographic-type detectors.

483.1+, for detectors with an image convertor screen.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclass 57 for closed container inspection, subclasses 58+ for X-ray flaw analysis, subclasses 62+ for X-ray absorption imaging, subclasses 98+ for X-ray radiography with electronic image display, subclasses 167+ for X-ray photographic detector supports and subclasses 189+ for X-ray nonphotographic detector supports including fluoroscopes.

390.03 With dose measurement:

This subclass is indented under subclass 390.01. Subject matter including means to determine quantity of incident neutron energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:

337, for thermoluminescent dosimeters.

370.07, for dose measurement with semiconductor detectors.

374+, for dose measurement with gas discharge devices.

472.1, for nonelectric, nonphotographic dosimeters.

475.2+, for photographic-type dosimeters.

484.1, for dosimeters having externally-activated luminescence.

390.04 Composition analysis:

This subclass is indented under subclass 390.01. Subject matter in combination with means to determine the constituents of an object.

SEE OR SEARCH THIS CLASS, SUBCLASS:

269.4, for composition analysis of a formation surrounding a bore-hole using a source.

370.03, for semiconductor detectors of fission fragment or fissionable isotopes.

SEE OR SEARCH CLASS:

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclass 159 for neutron activation analysis.

378, X-Ray or Gamma Ray Systems or Devices, subclasses 45+ for composition analysis using fluorescence, subclass 53 for composition analysis using absorption, and subclass 83 for composition analysis using spatial energy dispersion.

390.05 For moisture content:

This subclass is indented under subclass 390.04. Subject matter wherein the means is particularly adapted to determine the presence or quantity of water in the object.

SEE OR SEARCH THIS CLASS, SUBCLASS:

253, for geological testing.

339.1, for moisture analysis with an infrared source.

358.1+, for means to inspect passive solid objects.

390.06 Density/thickness/consistency analysis:

This subclass is indented under subclass 390.01. Subject matter in combination with means to determine one or more physical quantities of an object.

SEE OR SEARCH THIS CLASS, SUBCLASS:

308, for beta thickness gauges.

358.1+, for means to inspect passive solid objects.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclass 50 for thickness or density analysis using fluorescence, subclasses 54+ for thickness or density analysis using absorption, and

subclass 89 for thickness or density analysis using scatter.

390.07 Spectrum analysis:
This subclass is indented under subclass 390.01. Subject matter in combination with means to discriminate neutrons with respect to energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:
370.06, for spectrum analysis using a semiconductor detector.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclass 49 for X-ray fluorescence spectrometers.

390.08 Using time-of-flight spectrometers:
This subclass is indented under subclass 390.07. Subject matter wherein the discrimination means operates on the basis of the time it takes a selected neutron to travel a given distance.

SEE OR SEARCH THIS CLASS, SUBCLASS:
287, for ion mobility detectors and time-of-flight mass spectrometers.

390.09 Using diffractometers:
This subclass is indented under subclass 390.07. Subject matter wherein the discrimination means operates on the basis of diffraction.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 71+ for X-ray diffractometers.

390.1 Including beam control:
This subclass is indented under subclass 390.01. Subject matter in combination with means to modify, contain or eliminate at least some of the neutrons incident upon the responsive means.

(1) Note. See subclass 505.1 of this Class 250, (3) Note, for types of beam control.

SEE OR SEARCH THIS CLASS, SUBCLASS:
505.1, for radiation controlling means in general.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclass 84 for X-ray monochromators, subclasses 147+ for collimators, subclass 160 for X-ray shutters and choppers.

390.11 Including a scintillator:
This subclass is indented under subclass 390.01. Subject matter in combination with a luminophor which converts incident neutrons to another type of energy to which the means is responsive.

SEE OR SEARCH THIS CLASS, SUBCLASS:
213, for light amplifiers with vacuum tube circuits.
361+, for devices with a luminophor providing an electric signal.
370.11, for semiconductor detectors with a scintillator.
483.1, for detectors with an image convertor screen.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 185+ for photographic X-ray detectors with a convertor screen.

390.12 Position-sensitive:
This subclass is indented under subclass 390.01. Subject matter wherein the change in electric potential differential or current flow indicates the location of incidence of incident neutrons.

SEE OR SEARCH THIS CLASS, SUBCLASS:
363.02, for body scanners with a luminophor.
370.1, for semiconductor-type position-sensitive devices.
385.1+, for position-sensitive gas discharge devices.

391 This subclass is indented under subclass 390.01. Subject matter which include methods of detecting or measuring the change in electric potential differential or current flow generated when the responsive means is subjected to neutron particles.

392 This subclass is indented under subclass 390.01. Subject matter with means for indicating or recording the signal generated by the neutron responsive means.

393 This subclass is indented under subclass 336.1. Subject matter in combination with a claimed source of invisible radiation to which the signalling means responds.

(1) Note. This subclass takes those devices which are disclosed as being responsive to unclaimed sources as well as to the claimed source, (e.g., calibration "sample") as long as the means responsive to the unclaimed source is the same means that responds to the claimed source.

394 This subclass is indented under subclass 336.1. Subject matter including two or more radiant energy responsive electric signalling means.

395 This subclass is indented under subclass 336.1. Subject matter which include processes for producing an electrical signal between some two electrically accessible points.

396 This subclass is indented under the class definition. Subject matter having means to deflect, scan, spread or focus a beam of electrons or ions.

(1) Note. The subject matter of this subclass and the subclasses indented hereunder is often referred to as "electro-optical means" because its effect on electronic or ionic beams is similar to the effects of lenses or prisms on light beams.

(2) Note. Beam forming means, per se, or electron or ion accelerating means, per se, are not classified here even though they may be recited as focusing means since the definition of this subclass presupposes a beam already formed.

SEE OR SEARCH THIS CLASS, SUBCLASS:

423+, for ion generators with focusing means not of the beam lens type.

SEE OR SEARCH CLASS:

335, Electricity: Magnetically Operated Switches, Magnets, and Electromagnets, subclass 210, for ion or electron beam deflecting magnets, per se, and the Search Notes thereto for combinations including such magnet means.

397 This subclass is indented under subclass 396. Subject matter having means responsive to invisible radiation to signal the presence or intensity of such radiation.

(1) Note. The incident radiation may be the beam itself or some other radiation.

398 This subclass is indented under subclass 396. Subject matter having means to hold, position or accommodate an object to be irradiated by the beam, or such an object itself in combination with the lens.

399 This subclass is indented under subclass 398. Subject matter wherein the object irradiated itself gives off invisible radiation as a result of its having been struck by the beam.

400 This subclass is indented under subclass 398. Subject matter combined with means to move the material irradiated to, through, within or from the beam path or to cause a moving material to move to, through, within or from the beam path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

453.1, for means to convey an irradiated material to, through or from a beam path where no beam deflecting or focusing means is included in the combination.

423 This subclass is indented under the class definition. Subject matter comprising electrical means or processes to remove from or add to an electrically neutral atom or molecule one or more electrons to give to the atom or molecule a net electrical charge.

(1) Note. Subject matter in this subclass and the subclasses indented hereunder includes ion beam generators wherein the ion generator is combined with means to accelerate the ions in one general direction. Such means to accelerate typically includes accelerating electric field means or means to form the material to be ionized into a vapor jet so that the vapor particles after ionization, will be in beam form by virtue of their momentum.

(2) Note. This subclass is the residual locus for ion generators, per se, not elsewhere classified.

SEE OR SEARCH THIS CLASS, SUBCLASS:

396, for ion generators with beam deflecting or focussing means.

SEE OR SEARCH CLASS:

60, Power Plants, subclass 202 for ion motors.

313, Electric Lamp and Discharge Devices, subclass 62 for ion generators in Cyclotrons and subclasses 359.1+ for discharge devices with means to generate and accelerate positive or negative ions, and subclasses 231.01+ for means for supplying gas to the discharge space.

315, Electric Lamp and Discharge Devices: Systems, subclasses 111.01+ for means for supplying fluent material to a discharge device where the fluent material may be ionized to produce ions.

361, Electricity: Electrical Systems and Devices, subclasses 230+ for ion generators generally operated in the ambient atmosphere.

424 This subclass is indented under subclass 423. Subject matter comprising processes for removing from or adding to a neutral atom or molecule one or more electrons.

425 This subclass is indented under subclass 423. Subject matter having means to change the state of the material to be ionized from a solid to a vapor.

(1) Note. The vaporizing means may be the ionizing means.

426 This subclass is indented under subclass 423. Subject matter wherein the means to remove or add electrons comprises an electrical space discharge between at least two electrodes caused by an electrical potential difference between the electrodes in excess of the breakdown voltage of the space between them.

427 This subclass is indented under subclass 423. Subject matter wherein the means to remove or add electrons comprises means to project electrons toward the materials to be ionized.

428 This subclass is indented under the class definition. Subject matter having or comprising means to at least, partially enclose or restrain a gaseous, fluid or fluid-like material or means to allow or cause movement to, from or through such means, or means to move such means and, thus, the material.

(1) Note. Examples of subject matter of this subclass includes vessels or conduits, flat surfaces either to support the material against gravity or which utilize natural flow-inducing phenomena that contain radiating fluent material or such material that is to be irradiated.

429 This subclass is indented under subclass 428. Subject matter having means to vary or maintain constant the temperature of the fluent material.

430 This subclass is indented under subclass 428. Subject matter having a valve or pump to admit fluent material to or away from the containment, support or transfer means and power operated means to open or close the valve or turn off or on the pump.

(1) Note. The valve actuator may be, for example, a bias spring responsive to fluid pressure to open or close the valve or it may be a manual actuator powered by hand, other than merely a handle integral with a valve stem.

431 This subclass is indented under subclass 428. Subject matter having means therewith for removing the fluent material or other material from the surfaces or the interior of the containment, support or transfer means.

432 This subclass is indented under subclass 428. Subject matter combined with means subjecting the fluent material to radiation, or with a fluent material that is, itself, an emitter of radiation.

433 This subclass is indented under subclass 432. Subject matter having a transfer means comprising a movable means having a surface for supporting fluent material.

434 This subclass is indented under subclass 432. Subject matter having a transfer means comprising means to permit the force of gravity to move the fluent material.

(1) Note. The means of this subclass includes guides or walls down which the fluent material may fall.

435 This subclass is indented under subclass 432. Subject matter having a transfer means comprising a fluent material enclosing means having means to permit spatially separate ingress and egress of the fluent material.

436 This subclass is indented under subclass 435. Subject matter wherein the transfer means causes the fluent material to flow about the radiation source.

437 This subclass is indented under subclass 435. Subject matter wherein the material enclosing means provides a circuitous passageway for the fluent material that bends, twists or curves.

(1) Note. The transfer means of this subclass provides a roundabout path for the flow of fluent material generally for the purpose of increasing exposure to radiation or to increase the surface area or volume of material irradiated. The path may, for example, be sinuous, serpentine, spiral or helical.

438 This subclass is indented under subclass 435. Subject matter wherein the fluent material enclosing means has an obstructing means that changes the direction, velocity or some other characteristic of the flow of the fluent material.

440.11 Analyte supports:
This subclass is indented under subclass 306. Subject matter comprising structure for positioning or holding against gravity a material to be examined by particle irradiation.

441.11 With air lock or evacuation means:
This subclass is indented under subclass 440.1. Subject matter within a sellable space having an entrance opening with separately operable internal and external doors, or having means to lower the pressure within the space.

442.11 With object moving or positioning means:
This subclass is indented under subclass 440.1. Subject matter having means to change the location or position of material or an article to be examined or treated.

443.1 With heat transfer or temperature-indication means:
This subclass is indented under subclass 440.1. Subject matter wherein means are provided for conducting heat to or away from the object, or means for displaying information about the temperature of the object.

453.11 SUPPORTED FOR NONSIGNALLING OBJECTS OF IRRADIATION (E.G., WITH CONVEYOR MEANS):
This subclass is indented under the class definition. Subject matter wherein means are provided to sustain against gravity an article animate or inanimate, to be irradiated by radiant energy solely for the purpose of being treated or inspected.

(1) Note. Excluded from this subclass and the subclass indented hereunder are those articles which are detectors by virtue of their indication of incident radiation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

336.1+, for electric signalling means, per se, which may be combined with supports for nonsignalling objects.

458.1+, for sources and supported irradiated nonelectric signalling means.

472.1+, for nonelectric signalling means, per se, which may have support means.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 64+ for X-ray devices of this type.

454.11 With source support:

This subclass is indented under subclass 453.1. Subject matter in combination with a means to sustain against gravity the radiant energy producing means.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 193+ for X-ray source supports.

455.11 Source and object encasement (e.g., sterilizers):

This subclass is indented under subclass 454.1. Subject matter comprising receptacle means enclosing a source and an object support so that the object will be subjected to the radiant energy.

SEE OR SEARCH THIS CLASS, SUBCLASS:

496.1+, for receptacles, per se, containing radioactive sources.

458.1 LUMINOPHOR IRRADIATION:

This subclass is indented under the class definition. Subject matter which includes a source of radiant energy and a phosphor material which luminesces or which quenches luminescence as a result of excitation of the material by the radiant energy.

(1) Note. Combinations involving luminophor irradiation and detection of the visible luminescence are placed here and cross-referenced to the appropriate, photocell subclass in Class 250, subclasses 200+.

SEE OR SEARCH CLASS:

40, Card, Picture, or Sign Exhibiting, subclasses 542+ for indicia forming a display device including a fluorescent substance to cause illumination of the indicia.

348, Television, subclasses 805+ for cathode-ray tube plus a fluorescent screen.

356, Optics: Measuring and Testing, subclasses 213+ for the examination of light from a luminous source.

378, X-Ray or Gamma Ray Systems or Devices, subclasses 44+ for X-ray fluorescence devices.

459.1 Methods:

This subclass is indented under subclass 458.1. Subject matter which includes methods which include the irradiation of a phosphor material by a radiant energy source where not elsewhere provided.

461.1 With ultraviolet source:

This subclass is indented under subclass 458.1. Subject matter which include the phosphor material in combination with an ultraviolet radiation source.

461.2 Biological cell identification:

This subclass is indented under subclass 461.1. Subject matter including irradiation of a biological material for the purpose of identifying its type, composition or other characteristic, (e.g., cancerous).

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 45+ for X-ray fluorescence composition analysis.

462.1 Self-luminous article:

This subclass is indented under subclass 458.1. Subject matter which includes self-luminous articles or self-luminous attachments therefor where not provided for elsewhere.

(1) Note. The radiant energy source may be integral with the article or separate from the article as long as the source and article are both mounted on a common support.

SEE OR SEARCH CLASS:

40, Card, Picture, or Sign Exhibiting, subclasses 542+ for signs using luminous paint.

463.1 Dials, pointers, gauges, and bands:

This subclass is indented under subclass 462.1. Subject matter wherein the article is a gauge, timepiece, pointer, dial, or portions thereof or attachments therefor where not elsewhere classified.

464.1 Pendants:

This subclass is indented under subclass 462.1. Subject matter wherein the article is adapted to be supported from above and the luminous material is part of, supported within or on the article.

SEE OR SEARCH CLASS:

16, Miscellaneous Hardware, subclass 442 for flexible means to suspend knobs.

24, Buckles, Buttons, Clasps, etc., subclasses 115+ for chord and rope holders.

59, Chain, Staple, and Horseshoe Making, subclasses 78+ for chains, chain links, swivels and attachments.

465.1 Manual operators or luminous attachments therefor:

This subclass is indented under subclass 462.1. Subject matter wherein the luminous article is a device which is directly operated by hand or a luminous attachment for a manual operator not provided for elsewhere.

466.1 Covers, keys, or luminous attachments therefor:

This subclass is indented under subclass 462.1. Subject matter wherein the article is a static or movable closure member or a luminous attachment for a closure member which has an opening to permit movement of the movable member therein or therethrough or a key or a luminous attachment for a key where not provided for elsewhere.

SEE OR SEARCH CLASS:

70, Locks, subclasses 343+ for keys, per se, subclass 452 for escutcheons; and subclass 455 for key hole covers, generally.

174, Electricity: Conductors and Insulators, subclasses 66+ for electrical box covers.

220, Receptacles, subclasses 242+ for face plates for enclosures of general utility.

439, Electrical Connectors, subclass 123 for the combination of a switch and a supporting means with a closure member.

467.1 Reticles, gun sights or with optical element:

This subclass is indented under subclass 462.1. Subject matter wherein the articles include an integral optical device to direct the light rays emitted by the luminous article, a luminous optical device with markings which fluoresce or which markings are illuminated by the luminous light of the article, or luminous visual sight devices not provided for elsewhere.

472.1 INVISIBLE RADIATION RESPONSIVE NONELECTRIC SIGNALLING:

This subclass is indented under the class definition. Subject matter comprising means responsive to invisible radiation whose response is something other than an increase or decrease in electric potential difference or current flow between some two electrically accessible points and which response is used to indicate the presence, type or amount of incident radiation and methods utilizing such means.

(1) Note. This is the residual locus for invisible radiant energy signalling (i.e., detecting) means. For such means producing electric signals, see the search notes below.

(2) Note. The subject matter of this subclass and the subclasses indented hereunder, even though they produce no electric signal, may be electrically energized.

(3) Note. The radiation incident upon the means may cause a physical, structural or chemical change or a change in the energy content of the electrons of atoms making up the means.

(4) Note. The response of the means of this subclass may be inherently visible or it

may be latent, i.e., require development to make it visible.

SEE OR SEARCH THIS CLASS, SUBCLASS:

200+, for visible radiant energy responsive electric signalling devices (photocells) circuits and apparatus, not combined with means to convert invisible to visible radiant energy.

316.1+, and 327.2, for various recording type nonelectric signalling means in combination with sources.

330+, for nonelectric signalling means used to convert infrared images into visible images.

336.1+, for electric signalling invisible radiation responsive devices, especially subclasses 337 and 361+ for luminophors in combination with electric signal producing photocells.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 167+ and 189+ for X-ray responsive nonelectric signalling with detector support.

473.1 Methods:

This subclass is indented under subclass 472.1. Subject matter which includes processes for producing a nonelectric signal in response to invisible radiation.

474.1 Optical change type:

This subclass is indented under subclass 472.1. Subject matter which includes detectors which, upon receiving radiation, changes its optical properties.

(1) Note. The optical properties are transmission, reflection, refraction, diffraction, and color.

SEE OR SEARCH THIS CLASS, SUBCLASS:

327.2, for methods and apparatus which includes a radiation generator and a detector for recording radiation incident upon the detectors.

375, for methods of exposing a detector of this subclass to invisible radiant energy where only the intensity of this incident radiation is desired.

505.1+, for invisible radiation controlling means, per se, other than those responsive to infrared, visible light, X-ray and ultraviolet light.

SEE OR SEARCH CLASS:

204, Chemistry: Electrical and Wave Energy, subclasses 157.15+ for methods of irradiating materials by radiant energy to change an optical characteristic of the material.

252, Compositions, subclass 408 for radiation detectors and methods of making the detectors which change an optical property upon being subjected to radiation where the detector is no more than a composition.

359, Optics: Systems (Including Communication) and Elements, subclasses 240+ for optical devices which change an optical property in response to radiation.

378, X-Ray or Gamma Ray Systems or Devices, subclass 189 for X-ray responsive, nonphotographic detector supports.

501, Compositions: Ceramic, particularly subclass 13 for phototropic glass compositions.

520, Synthetic Resins or Natural Rubbers, in particularly Class 522, for methods of irradiating a synthetic resin or natural rubber material to change an optical characteristic of the material and to the material produced.

475.2 Photographic type:

This subclass is indented under subclass 472.1. Subject matter wherein the detector comprises a photographic type material, (e.g., in a film or plate), in a light proof housing, (e.g., cassettes or film packs), having at least a portion previous to invisible radiation.

(1) Note. Included in this subclass are cassettes and packs, per se, for invisible radiation responsive photographic type detectors.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 167+ for X-ray responsive photographic detector supports.

482.1 With radiation filter, modifier, or shield, (e.g., dosimeter badges):
This subclass is indented under subclass 475.2. Subject matter which includes radiation filter means cooperating with the contained film or pack to moderate, shield or filter some or all of the radiation before the radiation exposes the film.

(1) Note. Filters can modify visible light where a luminescent screen is included as part of a film pack or with a cassette or holder.

(2) Note. Herein are dosimeters, including the badge type, wherein the intensity or frequency of radiation is modified before being incident upon photographic material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
505.1+, for a radiation controlling means, per se.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 70+ for X-ray reflection or diffraction devices which includes X-ray radiation filters or modifiers and a photographic detector.

483.1 Luminescent device:
This subclass is indented under subclass 472.1. Subject matter which includes a significant structure which includes material which emits luminous energy when excited by particle or electromagnetic wave energy where not elsewhere classified.

SEE OR SEARCH CLASS:
252, Compositions, subclass 188.3 for chemical luminescence compositions; and subclasses 301.16+ for fluorescent and phosphorescent compositions.
313, Electric Lamp and Discharge Devices, subclasses 483+ for electroluminescent devices.
362, Illumination, subclass 84 for decorative electroluminescent panels.
378, X-Ray or Gamma Ray Systems or Devices, subclasses 44+ for X-ray fluorescence analysis; and subclasses 190+ for fluoroscopes.
427, Coating Processes, subclasses 157+ for coating processes in general wherein a florescent or phosphorescent coating is used and where no radiant properties or multilayered luminescent coating are claimed.
428, Stock Material or Miscellaneous Articles, appropriate subclasses for a stock material product in the form of a single or plural layer web or sheet which may have luminescent properties, and especially subclass 917 (a cross-reference art collection) for products which are electroluminescent.

484.2 Requiring an additional energy source to cause luminescence:
This subclass is indented under subclass 483.1. Subject matter wherein the material which emits luminous energy requires another energy source to raise the energy level of the material to luminescence.

484.3 With thermally stimulated phosphor:
This subclass is indented under subclass 484.2. Subject matter wherein the additional energy source is a source of heat.

SEE OR SEARCH THIS CLASS, SUBCLASS:
337, for systems that thermally excite to luminescence a material wherein the luminescence detector produces an electrical signal.

484.4 With optically stimulated phosphor:
This subclass is indented under subclass 484.2. Subject matter wherein the additional energy source is a source of light.

SEE OR SEARCH THIS CLASS, SUBCLASS:
582, for systems that use stimulable phosphors to record radiation, especially for recording the transmission of radiation through an object.
591, for systems that use other optically-stimulated materials to record radiation.

484.5 Dosimeter:
This subclass is indented under subclass 484.4. Subject matter wherein the material upon stimulation emits luminous energy in proportion to the previous accumulation of particle or electromagnetic energy therein.

SEE OR SEARCH THIS CLASS, SUBCLASS:
337, for systems that thermally excite a material to luminescence in proportion to the excitation by particle or electromagnetic energy and the luminescence detector produces an electric signal.

485.1 With light excluding casing having an aperture:
This subclass is indented under subclass 483.1. Subject matter wherein the structure includes a casing to enclose the material or has the (luminescent) material formed as a portion of the casing whereby visible light is excluded within the casing and an opening in the casing to permit the detection of luminous energy emitted by the material.

486.1 With plural luminescent material or plural luminescent containing layers or areas:
This subclass is indented under subclass 483.1. Subject matter wherein the structure includes plural luminescent materials, several luminescent layers or distinct areas or volumes of the same structure which contains the same or different luminescent materials.

487.1 With optical member of material to directly modify luminous energy:
This subclass is indented under subclass 483.1. Subject matter wherein the structure additionally includes a material or a member having an optical property to control or modify the luminous energy emitted by the luminous material.

488.1 Plural planar layer type:
This subclass is indented under subclass 487.1. Subject matter wherein the structure is an integral unit formed of plural, flat, sheetlike materials, one of the sheets containing luminescent material.

(1) Note. A coating is considered a layer for this subclass.

489 This subclass is indented under the class definition. Subject matter wherein a claimed apparatus is disclosed as functioning primarily for accumulating ions, usually for obtaining isotopes of increased purity, rather than for obtaining information of analytical value.

491.1 MEANS TO ALIGN OR POSITION AN OBJECT RELATIVE TO A SOURCE OR DETECTOR:
This subclass is indented under the class definition. Subject matter wherein means are provided to relatively immobilize the object in at least one direction or to provide an indication of the location of the object relative to the source or detector or their support.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 20, 68+, 177+, 195+, and 205+ for X-ray devices with object alignment or positioning means.

492.1 IRRADIATION OF OBJECTS OR MATERIAL:
This subclass is indented under the class definition. Subject matter comprising means or methods of irradiation an object or material including a source and not provided for in any of the preceding subclasses.

SEE OR SEARCH CLASS:
219, Electric Heating, for irradiation processes wherein the intent is to produce thermal changes in a material.
376, Induced Nuclear Reactions: Processes, Systems, and Elements subclasses 100+ and 156+ for subject matter wherein irradiation produces, or is intended to produce an induced nuclear reaction.
438, Semiconductor Device Manufacturing: Process, particularly subclasses 473+ for gettering of a semiconductor substrate via irradiation, subclasses 514+ for ion implantation of electrically active dopants into semiconductive regions, and subclasses 795+ for thermal treatment of a semiconductor substrate via irradiation to modify some property thereof.

606, Surgery, subclass 2.5 for subject matter relating to removal of a calculus (e.g., stone) from the body wherein the calculus is fractured or disintegrated by use of light energy.

492.2 Irradiation of semiconductor devices:
This subclass is indented under subclass 492.1. Subject matter wherein the object irradiated is made of, at least in part, a semiconductor material.

492.21 Ion bombardment:
This subclass is indented under subclass 492.2. Subject matter comprising a means for irradiating a semiconductive object or material with at least one ion beam.

(1) Note. This subclass provides, for example, for ion implantation, etching, and scanning or deflection of ions on said object.

SEE OR SEARCH THIS CLASS, SUBCLASS:
398, for deflection or focussing of charged particles onto an object.
423, for ion sources.
492.1, for irradiation with ultraviolet or infrared sources.
492.2, for irradiation directly by electrons including photoemissive electrons.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclass 34 for X-ray lithography.

492.22 Pattern control:
This subclass is indented under subclass 492.2. Subject matter having means (e.g., template, program) representing information necessary to variably expose the semiconductor object or material and means or steps responsive to the representing means to irradiate or re-irradiate the object or material accordingly.

(1) Note. Systems or methods of this subclass type may include memory means, deflection coils, feedback loops, computer processing means, and object movement means.

(2) Note. Patterns of this subclass type may, for example, reduce the "proximity effect" on the semiconductor object or material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
398, for deflecting or focussing charged particles onto the object.
491.1, for alignment of the irradiating beam and target.

492.23 Variable beam:
This subclass is indented under subclass 492.2. Subject matter including the use of a variable beam of charged particles which may be used to project a pattern onto an object.

(1) Note. The variable beam of this subclass type may be formed, for example, by at least two different operative means, one being projected onto another.

SEE OR SEARCH THIS CLASS, SUBCLASS:
492.22, for pattern control.

492.24 Photocathode projection:
This subclass is indented under subclass 492.2. Subject matter including using electrons emitted from photoemissive electrode irradiated by another source of electromagnetic radiation such as ultraviolet light.

(1) Note. Subject matter of this subclass may include, for example, mask and deflection coils between the photocathode and object.

SEE OR SEARCH THIS CLASS, SUBCLASS:
492.1, for irradiation of such devices with ultraviolet and infrared radiation.
492.2, for irradiation of semiconductor devices by electrons other than from a photocathode.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclass 34 for X-ray lithography.

492.3 Ion or electron beam irradiation:
This subclass is indented under subclass 492.1. Subject matter wherein the object or material is irradiated by a stream of charged particles.

493.1 RADIANT ENERGY GENERATION AND SOURCES:
This subclass is indented under the class definition. Subject matter which includes radiation emitters of this class type and not provided for elsewhere.

SEE OR SEARCH CLASS:
219, Electric Heating, for infrared heaters of the resistance arc, laser and electron bombardment type.
252, Compositions, subclasses 625+ radioactive; and subclasses 301.16+ for fluorescent or phosphorescent compositions, per se.
313, Electric Lamp and Discharge Devices, for generators, per se, of invisible radiation produced by electrical discharge devices, gas and vacuum tubes and incandescent lamps.
315, Electric Lamp and Discharge Devices: Systems, for sources of the Class 313 type plus the electric circuit to energize the device.
376, Induced Nuclear Reactions: Processes, Systems, and Elements, for nuclear reactors and reactions.
378, X-Ray or Gamma Ray Systems or Devices, subclasses 119+ for X-ray or gamma ray sources.

494.1 Plural radiation sources:
This subclass is indented under subclass 493.1. Subject matter which includes two or more radiation sources.

(1) Note. The plural sources may act concurrently, alternately or separately.

(2) Note. Generally the claimed apparatus does not include a circuit or power supply to power the radiation sources; however, the circuit and power supply may be claimed where no other class will take the arrangement.

SEE OR SEARCH CLASS:
313, Electric Lamp and Discharge Devices, subclass 1 for electric lamps or discharge devices structurally combined to form a unitary device.
315, Electric Lamp and Discharge Devices: Systems, subclass 35 for the combination of plural discharge devices loads having a circuit element; and subclasses 46 and 49 for a filament, electric heater or resistance in shunt or series with an electrical discharge load.

495.1 Including an infrared source:
This subclass is indented under subclass 494.1. Subject matter wherein at least one of the radiation sources emits radiation in the infrared portion of the spectrum.

496.1 With container for radioactive source and radiation directing or selectable shielding:
This subclass is indented under subclass 493.1. Subject matter comprising an enclosure including radioactive shielding material forming shielded positions, a passageway having an unshielded position formed at least in part within and extended from the interior to the periphery of the enclosure and a radioactive source within the container cooperable with the passageway so that the passageway directs the radiation of the source or forms a pathway for the radioactive source.

497.1 With means to move source between shielded and unshielded position:
This subclass is indented under subclass 496.1. Subject matter which further includes means to move the radioactive source within the passageway between a shielded and the unshielded position.

498.1 With pivoted or rotatable radiation shield:
This subclass is indented under subclass 496.1. Subject matter which includes a pivoted or rotatable radiation shield within the container or housing which cooperates with the passageway and the radioactive source to selectively permit in one position the radiation from the source to escape from the container or housing and in other positions to prevent the escape of radiation from the container or housing.

503.1 With radiation modifying member:
This subclass is indented under subclass 493.1. Subject matter which includes in addition to a radiation source, means to alter a radiation beams as to its cross section, intensity, direction or spectral or energy content.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray System or Devices, subclasses 145+ for X-ray beam control devices.

504 This subclass is indented under subclass 503. Subject matter wherein the source emits radiation in the ultraviolet or infrared portion of the spectrum.

505.1 RADIATION CONTROLLING MEANS:
This subclass is indented under the class definition. Subject matter comprising means to modify, contain or eliminate at least some of the emanations or (or caused by, in the case of secondary emissions) a source of invisible radiation.

(1) Note. Radiation includes secondary radiation along with primary radiation which causes the secondary radiation.

(2) Note. Included in this subclass are reflective elements and systems.

(3) Note. The devices in this group include apparatus (relying on optical principles) to (1) change or select the direction or shape of all or part of the radiation, (2) change or select the intensity or amount of the radiation, (3) to select certain of the frequencies of the radiation, (4) contain all of the radiation from passing beyond the devices (5) passing the devices in a given time, (6) change the intensity in a cyclic manner in a given amount of time or (7) to eliminate or reduce certain frequencies from the radiation on a directional basis.

(4) Note. This group of subclasses include the combination of a device of this group and an indicator which, for example, shows the shape or size of an aperture, created by adjustment, the pattern cast on a plane transverse to radiation passing through an aperture or a collimator or the distance between the shutter members forming an aperture.

(5) Note. The optical principles relied upon by these devices to control radiation include transmission, reflection, refraction, diffraction and absorption.

(6) Note. Included in this subclass are diaphragms and cones which are not adjustable.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 145+ for X-ray beam control devices.

506.1 Shielded receptacles for radioactive sources:
This subclass is indented under subclass 505.1. Subject matter wherein the means comprises a container impervious to invisible radiation to hold or enclose a radioactive source of such radiation.

(1) Note. The receptacles of this subclass type usually have an opening to permit placement therein or removal therefrom of a radioactive source and a removable closure to cover the opening. They may also have means to cool the receptacle and means to insert the source into the receptacle.

SEE OR SEARCH THIS CLASS, SUBCLASS:
343+, for contained static or flowing fluent material and electrical detectors of invisible radiation.
428+, for containers of fluent materials.
453.1, with object containers which are designed to permit the irradiation of the materials or objects by particle or electromagnetic wave energy provided for in this class.
496.1, for shielded vessels with radioactive sources for transporting the sources or permitting the use of the radioactive or nuclear source in a controlled manner.

SEE OR SEARCH CLASS:
215, Bottles and Jars, subclasses 1+ for ceramic or glass receptacles and

removable closures for the receptacles where not elsewhere classified.

220, Receptacles, for a container; and subclasses 200+ for a removable closure.

312, Supports: Cabinet Structure, subclasses 1+ for containers having doors and shelves generally.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 409+ for layered, canned or jacketed fuel components.

507.1 Having plural storage compartments or plural nested receptacles:

This subclass is indented under subclass 506.1. Subject matter wherein the container includes structure to form plural compartments to store plural radioactive sources or another container within the container to hold a radioactive or nuclear source.

515.1 Shields:

This subclass is indented under subclass 505.1. Subject matter comprising means to absorb radiant energy not elsewhere provided for.

SEE OR SEARCH CLASS:

252, Compositions, subclasses 582+ for optical filter compositions which include compositions for filtering ray energy.

359, Optics: Systems (Including Communication) and Elements, subclasses 350+ for infrared or ultraviolet apparatus; and subclasses 885+ for optical filters.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, appropriate subclasses for shield structures used as components of a nuclear reactor.

424, Drug, Bio-Affecting and Body Treating Compositions, subclasses 9.4+ for X-ray contrast compositions used in in vivo diagnosis or testing and subclasses 59+ for body treating compositions for topical sun or radiation screening.

427, Coating Processes, subclass 160 for coating processes wherein the coating has shielding properties.

428, Stock Material or Miscellaneous Articles, appropriate subclasses for a stock material product in the form of a single or plural layer web or sheet which may have the property of shielding against radiant energy and especially subclasses 432+ and 457+ for a nonstructural composite web or sheet including a layer of metal.

516.1 Garments:

This subclass is indented under subclass 515.1. Subject matter comprising articles of wearing apparel to protect the wearer against harmful electromagnetic or nuclear radiation.

(1) Note. An article of clothing claimed as more than a composition of radiation shielding material is classified here.

SEE OR SEARCH CLASS:

2, Apparel, especially subclass 48 for aprons, subclasses 158+ for mittens and gloves; and subclasses 243+ for methods of making various articles of clothing.

252, Compositions, subclass 478 for X-ray and neutron radiation shielding compositions.

517.1 Construction elements or building parts:

This subclass is indented under subclass 517.1. Subject matter wherein the means includes components used in the construction of walls and buildings and portions of buildings or walls which include material to shield against harmful electromagnetic or nuclear energy.

(1) Note. Included are blocks, wall panels and windows which contain radiation shielding materials.

518.1 With neutron absorption material:

This subclass is indented under subclass 515.1. Subject matter wherein the means includes devices containing neutron absorption material.

(1) Note. A composition of neutron absorption material made into a structural element shall be classified here.

SEE OR SEARCH CLASS:

252, Compositions, subclass 478 for compositions used as neutron shielding material.

376, Induced Nuclear Reactions: Processes, Systems, and Elements, subclasses 219+ for nuclear reactors having moderator structure including neutron moderators.

428, Stock Material or Miscellaneous Articles, appropriate subclasses for a stock material product in the form of a single or plural layer web or sheet which may have the function of absorbing neutrons.

523, Synthetic Resins or Natural Rubbers, for organic compounds used as neutron shielding equipment, particularly subclasses 136+ for resins with filler, dyes or pigments.

554, Organic Compounds, subclass 77 for esters containing boron type acids.

585, Chemistry of Hydrocarbon Compounds, for certain compositions containing hydrocarbons, and especially subclass 944 for a collection of patents which disclose radiation-resistant compositions.

519.1 Flexible:

Subject matter under 515.1 wherein the controlling means is constructed of a pliable material or so constructed that it is easily deformed or bent.

522.1 SOURCE SUPPORTS:

This subclass is indented under the class definition. Subject matter comprising structure to hold a radiation source not provided for elsewhere.

(1) Note. Housing for radiation sources of this class type not claiming a radiation shield or an aperture or other radiation controlling element are considered support structure and are included in this subclass.

SEE OR SEARCH THIS CLASS, SUBCLASS:

506.1, for shielded radioactive source receptacles.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 193+ for X-ray source supports.

526 This subclass is indented under the class definition. Subject matter which is not provided for in any of the preceding subclasses of this class.

548 This subclass is indented under subclass 201. Subject matter wherein the photocell detects a material having a cross-sectional dimension which is small compared to length and produces an electrical output which through additional structure controls the position, size or speed of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:

559.01+, for a web, strand, strip or sheet in the optical path including circuitry for analyzing the photocell output.

SEE OR SEARCH CLASS:

356, Optics: Measuring and Testing, subclass 364 for the examination of materials using polarized light; subclasses 625 for the measurement of dimensions; subclass 399 for determining lateral alignment; subclasses 402 for shade or color tests; subclasses 432 for determining light transmission or absorption of materials; subclasses 445 for measuring the reflectivity of materials; and subclasses 237.1 for the inspection for flaws or imperfections.

549 This subclass is indented under subclass 201. Subject matter wherein the illumination which falls on the photocell comes from a light source which comprises a cathode-ray tube and said photocell electrically controls the cathode-ray tube.

(1) Note. See (4) Note under the definition of subclass 200 for a general distinction between subject matter of this class (250) and Class 315 and Class 348.

SEE OR SEARCH THIS CLASS, SUBCLASS:

202, for optical systems wherein the photocell follows the edge of a pattern under control of the illumination.

SEE OR SEARCH CLASS:

315, Electric Lamp and Discharge Devices: Systems, subclasses 10+ for photocell circuits in which the photocell controls a cathode-ray tube but does not include the combination of mechanical devices, optical devices or specific input sources of information. Examples of cathode-ray tube control of this class (315) include means to control the intensity of the tube, means to automatically control the contrast of said tube under quiescent conditions or means to generate a scale or grid on the face of said tube.

340, Communication: Electrical, including a cathode-ray tube in combination with an input circuit for processing a signal for the purpose of communication. Note appropriate subclasses, specifically subclasses 146.3 and 343.

348, Television, subclasses 602+ for control of brightness or contrast of display on a cathode-ray tube dependent on ambient light sensed by photocells.

550 This subclass is indented under subclass 200. Subject matter wherein the photocell detects an interference pattern and produces an electrical output.

(1) Note. The interference pattern may be produced as a result of moire interference between similar patterns, a diffraction pattern of a grating, wire or hole or produced by holograms.

SEE OR SEARCH CLASS:

356, Optics: Measuring and Testing, subclass 395 for the superimposition of grids to measure or compare dimensions or configurations.

551 This subclass is indented under subclass 200. Subject matter including a light source and an optical link which couples the light source and photocell and wherein an electrical input signal applied to the light source is optically coupled to a detector which provides an electrical output signal having the characteristics of the input signal.

(1) Note. In general the isolator of this subclass is intended as an electric circuit element to insulate the output from the input and/or provide common mode rejection at the input.

552 This subclass is indented under subclass 200. Subject matter having a photocell means which detects a light emitting source wherein the source is composed of a semiconductor material.

(1) Note. In order to be classified in this subclass, the solid state light source must be recited other than by name only.

SEE OR SEARCH THIS CLASS, SUBCLASS:

211, for a photocell which is composed of a semiconductor material and which controls an electrical or electromechanical system.

SEE OR SEARCH CLASS:

257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), subclasses 80 through 85 for semiconductor light emitting sources combined with semiconductor light responsive devices.

327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, subclasses 514+ for nonlinear solid-state circuit or system which depends upon an external light source.

331, Oscillators, subclasses 43+ for oscillators of the molecular or particle resonant type; e.g., maser type. The combination may include a photocell.

359, Optical: Systems and Elements, subclasses 333 through 349 for means for applying an electric signal to an amplifying device which is an optical laser and means for securing an amplified output therefrom where the combination may include a photocell.

362, Illumination, subclasses 276 and 277+ for illuminating means having a movable screen which is automatically controlled by a photocell wherein said illumination means may be solid statelight emitting source.

372, Coherent Light Generators, appropriate subclasses for laser type oscillators.
398, Optical Communications, various subclasses for light wave communication.

553 This subclass is indented under subclass 552. Subject matter having a plurality of solid state light sources arranged in a particular group, order or formation.

554 This subclass is indented under subclass 200. Subject matter having a photocell means which detects a light source wherein the light from the source is generated by means of a material being consumed.

(1) Note. The combination does not involve the testing of materials.

SEE OR SEARCH THIS CLASS, SUBCLASS:
336.1, for devices in which a photocell means detects invisible radiant energy.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 74+ for the examination of or testing of a substance by means of light. Included here are spectroscopes.

555 This subclass is indented under subclass 206. Subject matter with data bearing means containing information in symbolic form where the symbols are arbitrarily given certain meanings, and means for illuminating said data bearing means prior to the photoelectric cell, or methods of using such means.

(1) Note. The coded record may be illuminated by a light source or it may be the source of illumination.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for invisible radiation responsive code readers.
566, for optical or pre-photocell-systems wherein the photocell does not control an electrical or electromechanical system.

SEE OR SEARCH CLASS:
235, Registers, subclasses 454+ for coded record sensing devices utilizing light to sense the coded indicia on the record and including particular circuitry to process the electrical signals generated by the sensing process. The term processing of signals includes: (1) generation and utilization of timing signals and sync signals, (2) the storage of signals, and (3) the incorporation of means for counting.

556 This subclass is indented under subclass 555. Subject matter wherein the document, which is a sheet-like article, is analyzed or tested for its authenticity by means of a photocell system; or comprising a record reader wherein the coded information is represented by a graph or plot on the record.

SEE OR SEARCH CLASS:
340, Communications: Electrical, subclass 146.2, for devices having means for comparing items or intelligence with each other and for indicating a result in accordance with the comparison.
356, Optics: Measuring and Testing, subclass 71 for analysis of document by comparison which includes a support for the document to be tested.
382, Image Analysis, appropriate subclass for pattern or character recognition systems, see Class 382 II B (1) Note.

557 This subclass is indented under subclass 555. Subject matter having means for adjusting, centering, aligning, arranging or sorting the record; or means to detect the presence of the record, per se.

558 This subclass is indented under subclass 206. Subject matter including one or more photocells responsive to stereoscopically related images.

SEE OR SEARCH THIS CLASS, SUBCLASS:
550, for photocell apparatus responsive to the interference patterns which ultimately may be employed to examine contours.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 2 for stereoplotters wherein an actual plot of contours is provided from a stereo-pair.

559.01 With circuit for evaluating a web, strand, strip, or sheet:
This subclass is indented under subclass 200. Subject matter wherein a photocell is responsive to light from a material having a cross-sectional dimension which is small compared to length, and through additional structure (i.e., a circuit) produces an electrical or mechanical output indicative of some characteristic of the material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
548, for similar subject matter wherein the output is employed to control the material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 237.1 for the inspection for flaws or imperfections, subclass 364 for the examination of materials using polarized light, subclasses 600 for flatness tests, subclasses 625 for measurement of dimensions, subclasses 399 for determining lateral alignment, subclasses 402 for shade or color tests, subclasses 429 for monitoring of moving webs or thread, subclasses 432 for determining light transmission or absorption of materi, and subclasses 445 for measuring the reflectivity of materials.

559.02 Evaluation of photographic film:
This subclass is indented under subclass 559.01. Subject matter wherein a circuit produces an output indicative of some characteristic of a photographic film.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 443+ for measuring and testing of photographic film with an optical system.

559.03 Sequential detector arrangement:
This subclass is indented under subclass 559.01. Subject matter wherein photocells are arranged to perform plural independent successive detections of the same portion of the material and wherein the detections are subsequently jointly evaluated to determine some characteristic of the material.

559.04 Evaluation by regions, zones, or pixels:
This subclass is indented under subclass 559.01. Subject matter wherein discrete sections of the material are detected and evaluated independently.

559.05 With imaging:
This subclass is indented under subclass 559.04. Subject matter wherein an optical image is formed by combining individual photocell detections or pixel signals into a single image.

559.06 With scanning:
This subclass is indented under subclass 559.04. Subject matter wherein the material moves relative to the photocell field of view during the measurement process.

559.07 With imaging:
This subclass is indented under subclass 559.01. Subject matter wherein photocells detect an optical image of the material and a circuit produces a resulting signal used to determine some characteristic of the material.

559.08 With camera:
This subclass is indented under subclass 559.07. Subject matter wherein the optical image is detected by a photodetector array.

SEE OR SEARCH CLASS:
348, Television, subclass 88 for television including structure dictated by use.

559.09 With polarization:
This subclass is indented under subclass 559.01. Subject matter having polarizing means in the optical path between a light source and the photocell.

SEE OR SEARCH THIS CLASS, SUBCLASS:
225, for polarizing means in a photocell circuit with an optical or pre-photocell system.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 364+ for polarized light examination.
359, Optics: Systems (Including Communication) and Elements, subclasses 483+ for polarizers, per se.

559.1 With calibration:
This subclass is indented under subclass 559.01. Subject matter wherein the process of quantifying a property or attribute of the material includes establishing a reference level or scale.

(1) Note. References are established by normalizing the measurement of interest with a reference measurement (e.g., from a reference wavelength) or by measuring the response of the system under known conditions (e.g. first measuring fixed samples).

SEE OR SEARCH THIS CLASS, SUBCLASS:
252.1, for calibration or standardization in general.

559.11 Detection of both reflected and transmitted light:
This subclass is indented under subclass 559.01. Subject matter wherein photocells are arranged to receive light which has been reflected by the material and light which has been transmitted through the material.

559.12 Beam interruption or shadow:
This subclass is indented under subclass 559.01. Subject matter wherein some characteristic of an opaque material is determined by measuring the proportion of the amount of light detected by a photocell (when the opaque material is placed in the light path between the photocell and a light source) to the amount of light detected by the photocell from the source in the complete absence of the opaque material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 639 for measuring a moving object by light interruption.

559.13 With laser source:
This subclass is indented under subclass 559.12. Subject matter wherein the photocell receives light from a coherent light source.

559.14 With rotation of material:
This subclass is indented under subclass 559.12. Subject matter wherein a characteristic of the material is determined by making a series of measurements while the material is rotating.

559.15 With plural detectors:
This subclass is indented under subclass 559.12. Subject matter having more than one independent photocell to detect light from the source.

559.16 Detection of diffuse light:
This subclass is indented under subclass 559.01. Subject matter wherein detection means are arranged to receive non-specularly reflected light from the material (i.e., the angle of the light reflected from the material is not equal to the angle of the light incident to the material).

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 446 for optical measuring with diffusion of reflected light.

559.17 With diffusion optics:
This subclass is indented under subclass 559.16. Subject matter having light scattering optics in the optical path between a light source and the photocell.

559.18 With discrimination of discrete light diffusing region:
This subclass is indented under subclass 559.16. Subject matter wherein photocells are arranged to detect light reflected from the material such that the presence of a discrete light diffusing region is determined by a change in the reflected light intensity.

559.19 Measuring dimensions:
This subclass is indented under subclass 559.01. Subject matter including a circuit responsive to a photocell, and wherein the photocell is arranged relative to the material so that the circuit provides an output indicative of some dimension of the material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 625 for measuring dimen of a material with an optical system.

559.2 With comparison to reference or standard:
This subclass is indented under subclass 559.19. Subject matter wherein evaluation of the material includes comparing the circuit output to a reference or stored value.

559.21 Volume:
This subclass is indented under subclass 559.19. Subject matter wherein the circuit output is indicative of the three-dimensional displacement of the material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 627 for measuring of volume of a material with an optical system.

559.22 Profile:
This subclass is indented under subclass 559.19. Subject matter wherein the circuit output is indicative of a surface contour of the material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 601 for measuring of contour or profile of material with an optical system.

559.23 With triangulation:
This subclass is indented under subclass 559.22. Subject matter wherein the profile is determined using optical triangulation.

559.24 Transversal measurement (e.g., width, diameter, cross-sectional area):
This subclass is indented under subclass 559.19. Subject matter wherein the circuit output is indicative of some cross- sectional dimension of the material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 635 for measuring of width or diameter of material with an optical system.

559.25 Lumber:
This subclass is indented under subclass 559.24. Subject matter wherein the material being evaluated is lumber.

559.26 Longitudinal measurement (e.g., length or spacing):
This subclass is indented under subclass 559.19. Subject matter wherein the circuit output is indicative of a linear dimension of the material or feature which lies parallel to the length of the material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 634 for measuring of length of a material with an optical system.

559.27 Thickness:
This subclass is indented under subclass 559.19. Subject matter wherein the circuit output is indicative of the distance from the upper surface of the material to the lower surface of the material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 631 for measuring of thickness of a material with an optical system.

559.28 With translucent material:
This subclass is indented under subclass 559.27. Subject matter wherein photocells are arranged to detect light which has passed through the material from a source on the opposite side of the material.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 632 for measuring of thickness of light permeable material with an optical system.

559.29 Measuring position:
This subclass is indented under subclass 559.01. Subject matter including a circuit responsive to a photocell, and wherein the pho-

tocell is arranged relative to the material so that the circuit provides an output indicative of the location of the material relative to some reference frame.

559.3 With alignment detection:
This subclass is indented under subclass 559.29. Subject matter wherein the position detected is indicative of the alignment of two or more objects.

559.31 With triangulation:
This subclass is indented under subclass 559.29. Subject matter wherein the position is determined using optical triangulation.

559.32 Measuring rate of motion or flow (change of position):
This subclass is indented under subclass 559.29. Subject matter wherein the time rate of change of the position of the material is determined by repeatedly measuring the position of the material at discrete time intervals.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclasses 28 and 28.5 for velocity determining optical systems.

559.33 With robotics:
This subclass is indented under subclass 559.29. Subject matter wherein photocells are arranged on a mechanically movable apparatus which moves the photocells into position to make measurements of the material.

SEE OR SEARCH CLASS:
901, Robots, subclass 47 for robots with optical sensing devices.

559.34 Lead or wire bond inspection:
This subclass is indented under subclass 559.19. Subject matter wherein the location and integrity integrated circuit connections are evaluated.

559.35 Centroid:
This subclass is indented under subclass 559.19. Subject matter wherein the circuit output is indicative of the position of the center of gravity or center of mass of the material.

559.36 Edge:
This subclass is indented under subclass 559.19. Subject matter wherein a process of determining position includes an intermediate step of detecting the location of an edge or edges of the material.

559.37 Angular orientation (e.g., skew):
This subclass is indented under subclass 559.19. Subject matter wherein the circuit output is indicative of an angle of the material relative to the reference frame.

559.38 Determining range from detector:
This subclass is indented under subclass 559.19. Subject matter wherein the reference frame used to express the position of the material is centered at the photocell or optical system.

SEE OR SEARCH CLASS:
356, Optics: Measuring and Testing, subclass 4 for range finding optical systems with a photocell.

559.39 With comparison to reference or standard:
This subclass is indented under subclass 559.01. Subject matter wherein evaluation of the material includes comparing the circuit output to a reference or stored value.

559.4 With indication of presence of material or feature:
This subclass is indented under subclass 559.01. Subject matter including a circuit responsive to a photocell, and wherein the photocell is arranged relative to the material so that the circuit provides an output indicating the presence or absence of the material or some indicia on the material in some predefined location.

559.41 With foreign particle discrimination circuitry:
This subclass is indented under subclass 559.4. Subject matter wherein the circuit provides the capability to identify the presence of a foreign substance on or embedded in the material from variations in a detected light signal.

559.42 Discontinuity detection (e.g., hole, crack):
This subclass is indented under subclass 559.4. Subject matter wherein the circuit output indicates the presence or absence of a discontinuity in the material.

559.43 Break detection:
This subclass is indented under subclass 559.4. Subject matter wherein the circuit output indicates the complete separation of one portion of the material from another portion of the material (e.g., a strand break).

559.44 Identifying marking, pattern, or indicia:
This subclass is indented under subclass 559.4. Subject matter wherein the circuit output indicates the presence or absence of a marking, pattern, or indicia on the surface of the material.

(1) Note. This subclass does not include subject matter which identifies or decodes markings, patterns, or indicia.

559.45 With defect discrimination circuitry:
This subclass is indented under subclass 559.4. Subject matter wherein the circuit provides the capability to identify the presence of a flaw in the material from variations in a detected light signal.

SEE OR SEARCH CLASS:
209, Classifying, Separating, and Assorting Solids, subclasses 509+ for sorting of items by identifying features.

559.46 With camera or plural detectors:
Subject matter under 559.45 wherein the detection means comprises plural detectors or a detection array camera.

559.47 With counting means:
This subclass is indented under subclass 559.45. Subject matter having means to count the number of defects or numbers of types of defects which are detected over a period of time.

SEE OR SEARCH CLASS:
377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, subclass 53 for counter systems with photoelectric detectors.

559.48 With transversal scan:
This subclass is indented under subclass 559.45. Subject matter wherein the field of view of the photocell is scanned transversally across sections of the material.

559.49 With moving reflector:
This subclass is indented under subclass 559.48. Subject matter wherein the transversal scan is accomplished by a moving reflector means having one or more reflective surfaces.

564 This subclass is indented under subclass 206. Subject matter including a circuit responsive to a photocell having fluent material in its optical path, wherein the circuit provides an output indicative of the density, scattering properties, index of refraction or the like, of the fluent material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
573+, for fluent material in the optical path of a prephotocell system.

565 This subclass is indented under subclass 564. Subject matter including a circuit or circuits for evaluating the relative output of two photocells, a photocell and a stored value or the photocell output sequentially as from a sample and standard.

566 This subclass is indented under subclass 216. Subject matter comprising data bearing means containing information in symbolic form where the symbols are arbitrarily given certain meanings and means for illuminating said data bearing means prior to the photoelectric cell; or methods of using such means.

(1) Note. The coded record may be illuminated by a light source or it may be the source of illumination.

SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for invisible radiation responsive code readers.
555, in which the photocell controls an electrical or electromechanical system.

SEE OR SEARCH CLASS:

235, Registers, subclasses 454+ for coded record sensing devices utilizing light to sense the coded indicia on the record and including particular circuitry to process the electrical signals generated by the sensing process. The term processing of signals includes: (1) generation and utilization of timing signals and sync signals, (2) the storage of signals and (3) the incorporation of means for counting.

568 This subclass is indented under subclass 566. Subject matter where the date consist of discrete identical indicia and is represented by the relative positional locations of the indicia on the record.

SEE OR SEARCH CLASS:

340, Communication: Electrical, subclass 146.2 for means for comparing signals or information in digital form to determine which is the greater, the lesser, or whether they are numerically equal.

569 This subclass is indented under subclass 568. Subject matter wherein the record is a flat rectangular sheet.

570 This subclass is indented under subclass 568. Subject matter wherein the record is in the shape of a narrow strip of flexible material a cylinder, or a flat circular form.

573 This subclass is indented under subclass 216. Subject matter having fluent material in the optical path.

(1) Note. The fluent material may, e.g., be a fluid, particulate matter suspended in a fluid, smoke, powder or sabulous material.

SEE OR SEARCH CLASS:

73, Measuring and Testing, subclasses 53.01+ for a liquid analyzer having radiant energy detection means therein and especially subclass 61.69 for a sedimentation rate measuring apparatus including radiant energy responsive means and subclass 61.48 for analyzing a liquid constituent of a liquid mixture by means of optical irradiation.

574 This subclass is indented under subclass 573. Subject matter including structure associated with the photocell or the photocell is so placed as to be responsive to light dispersed, scattered or reflected by the fluent material.

575 This subclass is indented under subclass 573. Subject matter including more than one optical path or separate fluent materials in one optical path.

(1) Note. The subject matter of this subclass includes the provision of one path for the fluent material and a reference path which may include only the ambient atmosphere.

576 This subclass is indented under subclass 573. Subject matter including means to contain, constrain, move or guide fluent material to the optical path.

577 This subclass is indented under subclass 573. Subject matter including structure associated with the photocell or the placement of the photocell to specifically detect the volume or elevation of a contained fluent material.

578.1 Plural light sources or optical paths: This subclass is indented under subclass 216. Subject matter in which the optical or pre-photocell system includes more than one light source or more than one optical path from one or more light sources to the photocell(s).

SEE OR SEARCH THIS CLASS, SUBCLASS:

204, adjusting optical system to balance brightness in plural paths.

208.2, plural photosensitive nonimage detecting elements for systems which typically involve plural light sources or optical paths.

553, array or matrix solid-state light sources, for plural light sources.

580 SOURCE WITH RECORDING DETECTOR:

This subclass is indented under the class definition. Subject matter comprising (1) a source of invisible radiation of the class type and (2) a means (i.e., recording detector) sensitive to the radiation from the source, or secondary radiation generated by the source, whose response (visible or latent; i.e., invisible) is effectively permanent (or "semi-permanent" in the sense that it can be reversed and the device re-used for subsequent recordings), and, where an image of an object is desired, (3) the object in the radiation path from the source to the detector.

(1) Note. The radiation path of (3) *supra* will include the path of radiation deflected from the object if the recording detector is to respond to deflected radiation or the path of transmitted radiation if the recording detector is to respond to radiation that passes through the object without substantial deflection.

(2) Note. Fluorescent and phosphorescent detectors whose response to invisible radiation of the class type may outlast their exposure to such radiation are excluded from this subclass and the indented subclasses as not being effectively permanent. See search notes below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

306+, for photographically recording the bombardment of objects by charged particles.

458.1+, for irradiation of fluorescent and phosphorescent detectors.

472.1+, for recording detectors, per se.

483.1+, for fluorescent and phosphorescent detectors, per se.

SEE OR SEARCH CLASS:

378, X-Ray or Gamma Ray Systems or Devices, subclasses 62, 87, 98, and 99 for imaging systems using an X-ray source and X-ray detector wherein the detector is not a stimulable phosphor.

581 Using a stimulable phosphor:

This subclass is indented under subclass 580. Subject matter in which the radiation sensitive means is a stimulable phosphor.

(1) Note. The radiation sensitive means may be described as a stimulable phosphor sheet, a photostimulable substrate, a storage plate, or an imaging plate.

(2) Note. A stimulable phosphor absorbs radiation wavelength, is stimulated by radiation of a longer wavelength, and emits radiation of an intermediate wavelength.

SEE OR SEARCH THIS CLASS, SUBCLASS:

484.4, for stimulable phosphor sheets, per se.

SEE OR SEARCH CLASS:

252, Compositions, subclasses 301.16+ for organic luminescent compounds and subclasses 301.4+ for inorganic luminescent compounds.

427, Coating Processes, subclass 64 for production of luminescent screens.

430, Radiation Imagery Chemistry: Process, Composition, or Product Thereof, subclass 6 for radiation screens and subclass 139 for luminescent imaging.

582 With image recording:

This subclass is indented under subclass 581. Subject matter including means which are directed particularly to recording the desired image of the object upon the radiation sensitive means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

583, for image recording in specialized applications such as tomography, mammography, autoradiography, or electron microscopes.

589+, for image recording with a means for transporting the radiation sensitive means.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclass 146 for scanning systems with an X-ray source and detector.

583 For specialized application:
This subclass is indented under subclass 582. Subject matter including means which are directed particularly to recording the desired image of the object upon the radiation sensitive means in specialized applications such as tomography, mammography, autoradiography, or electron microscopes.

SEE OR SEARCH THIS CLASS, SUBCLASS:
311, and 397, for electron microscopes, per se.

SEE OR SEARCH CLASS:
378, X-Ray or Gamma Ray Systems or Devices, subclasses 21+ for tomography and subclass 37 for mammography.
600, Surgery, subclasses 407+ for applications where a diagnosis is made by analyzing the scanned images.

584 With image read-out:
This subclass is indented under subclass 581. Subject matter including means which are directed particularly to making a latent recorded image of the object visible.

SEE OR SEARCH THIS CLASS, SUBCLASS:
585, and 586, for image read-out having particular form of stimulation or emission detection.

SEE OR SEARCH CLASS:
358, Facsimile and Static Presentation Processing, subclass 302 for laser scanners used in; e.g., facsimile machines.

585 Including stimulation:
This subclass is indented under subclass 584. Subject matter including means which are directed particularly to the stimulation of the radiation sensitive material.

SEE OR SEARCH CLASS:
128, Surgery, subclasses 1+ for radiation applied to the living body as therapeutic treatment.

586 Including emission detection:
This subclass is indented under subclass 584. Subject matter including means which are directed particularly to the detection of the stimulated emission from the radiation sensitive material.

SEE OR SEARCH THIS CLASS, SUBCLASS:
587, for stimulated emission detection where the detection is used to adjust the read-out conditions.

587 With adjustment of conditions:
This subclass is indented under subclass 586. Subject matter including means which are directed particularly to the detection of the stimulated emission from the radiation sensitive material and the detection is used to adjust the read-out conditions.

588 With erasure:
This subclass is indented under subclass 581. Subject matter including means which are directed particularly to the reversal of the response of the radiation responsive material to enable its re-use for subsequent image recordings.

(1) Note. The reversal is usually termed "erasure" when using stimulable phosphor sheets. Erasure may also be necessary to remove "fog" which develops in the sheets overtime; e.g., from incorporated radioactive isotopes.

589 With conveyance:
This subclass is indented under subclass 581. Subject matter including means which are directed particularly to means for transporting the radiation sensitive means.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclasses 18+ for sheet separators, and subclasses 264+ for sheet conveying means.

378, X-Ray or Gamma Ray Systems or Devices, subclass 172 for an X-ray serial plate or cassette changer, subclass 173 for an X-ray plural film or film pack changer, and subclass 181 for movable X-ray film plate supports.

590 With a recirculation path:
This subclass is indented under subclass 589. Subject matter including means which are directed particularly to means for transporting the radiation sensitive means, and the path of transport recirculates the radiation sensitive means.

SEE OR SEARCH CLASS:
271, Sheet Feeding or Delivering, subclass 3.1 for recirculating sheet transport (e.g., document copiers).

591 Including a light beam read-out:
This subclass is indented under subclass 580. Subject matter including means which are directed particularly to reading out a latent recorded desired image of the object using a light beam.

(1) Note. Means using a stimulable phosphor as the radiation sensitive means is excluded from this subclass. See search note below.

SEE OR SEARCH THIS CLASS, SUBCLASS:
585, for means to stimulate a stimulable phosphor sheet, which may include a light beam.

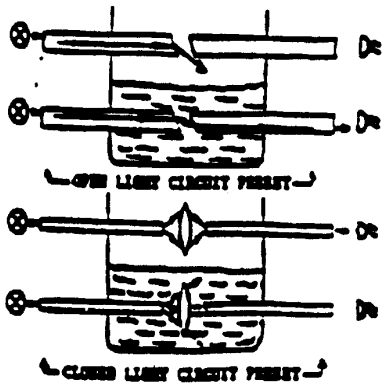
CROSS-REFERENCE ART COLLECTIONS

900 OPTICAL LIQUID LEVEL SENSORS:
Art collection of liquid level sensor photocell systems which employ light conductors to detect the absolute or relative level of liquids.

(1) Note. To be classified herein, significant light conductor means must be recited in the claim(s).

SEE OR SEARCH CLASS:
62, Refrigeration, subclasses 188 and 218+ for refrigeration means having liquid level control.
73, Measuring and Testing, subclasses 290+, especially subclass 293, liquid level or depth gauges combined with liquid level indicators for determining the level or depth of a body of liquid not otherwise classifiable.
116, Signals and Indicators, subclasses 109+ for liquid level alarms for indicating changes in liquid level; and subclasses 227+ for liquid level indicators. This class is directed to non-electrical liquid level detectors but includes electrical indicating means.
137, Fluid Handling, subclass 386, for liquid level responsive or maintaining systems which sense liquid level and exercise flow control; and subclasses 101.25+ for self-proportioning systems with liquid level sensing.
222, Dispensing, subclasses 64+, material level control systems.
340, Communications: Electrical, subclass 619 for optical liquid level condition responsive systems responsive to liquid level and claiming a particular indicator means.

901 With gap between light guide elements (includes open light path preset):
This subclass is indented under subclass 900. Art collection of liquid level sensors related to those in ... in which a light guide which transmits light from a light source to a detector has a gap which light from the source traverses, or does not traverse, depending on the angle of the end faces of the light conductor, whether or not the liquid is in the gap, etc. The designation "open light circuit present" means that light from the light source normally is not transmitted from one light conductor end face across a gap to the other light conductor end face when the gap is not filled with liquid. The designation "closed light circuit preset" means that light from the light source is normally transmitted across the gap between the light conductor end faces when liquid is not filling the gap. Illustrations of open and closed light circuits appear below:

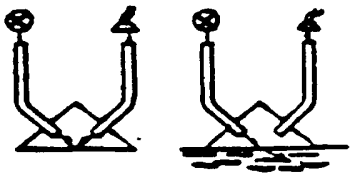


902 With closed light path preset:
This subclass is indented under subclass 901. Art collection of liquid level sensors related to those in ... in which light from the light source is normally transmitted across the gap formed by light conductor end faces to the photodetector in the absence of liquid in the gap.

(1) Note. An illustration of this situation is found above, in the definition of subclass 901.

903 With prism contacting liquid:
This subclass is indented under subclass 902. Art collection of liquid level sensors related to those in ... in which a prism forms the gap between the fibers and the prism is placed in contact with the liquid to open the light path in the gap.

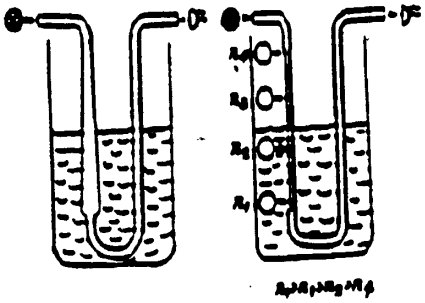
(1) Note. An illustration of this situation appears below:



904 With single light guide element to guide light in a continuous path:
This subclass is indented under subclass 900. Art collection of liquid level sensors related to those in ... in which a single continuous light conductor guides light therein in a closed path preset from a light source to a photodetector and, when contacted by a liquid, light is coupled into the liquid and out of the conductor.

905 With longitudinal irregularity:
This subclass is indented under subclass 904. Art collection of liquid level sensors related to those in ... in which the light conducting guide has some nonregular aspect along its longitudinal axis. For example, the surface of the light conducting guide is not parallel to the longitudinal axis thereof, or has a variation in its optical parameters along its longitudinal axis, e.g., a graded refractive index.

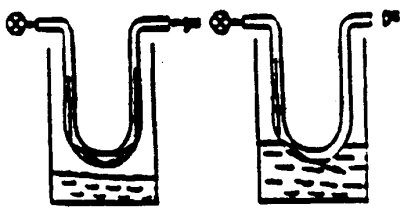
(1) Note. Illustration of longitudinal irregularities appear below:



906 With large scale longitudinal bend:
This subclass is indented under subclass 905. Art collection of liquid level sensors related to those in ... in which the light conducting guide is bent along its longitudinal axis and the bend is macroscopic, e.g., the entire guide is bent into a U-shape, as distinct from a plurality of microscale bends where the overall shape of the guide may still be straight.

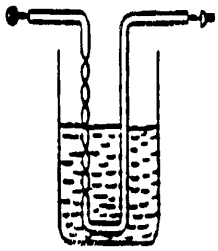
(1) Note. Typically, the light conducting guide is curved or bent along its longitudinal axis and the light is coupled out of the guide and into the liquid at a point

along the curve or bend therein. An illustration appears below:



907 With portions of light guide coating or cladding removed:
This subclass is indented under subclass 905. Art collection of liquid level sensors relating to those found in ... in which the longitudinal irregularity comprises an irregular longitudinal surface caused by removal (e.g., roughening) of portions of the light conductor coating or cladding.

908 With waveguide twisted about its longitudinal axis:
This subclass is indented under subclass 905. Art collection of liquid level sensors relating to those in ... in which a light conducting waveguide is twisted about its longitudinal axis, which results in a conversion of the lowest order light beam transverse electromagnetic (TEM) modes input into the light conducting waveguide into an output of higher order modes because of the continually rotating cross-section of the waveguide. An illustration of this type of waveguide appears below:



909 METHODS AND APPARATUS ANCILLARY TO STIMULABLE PHOSPHOR SYSTEMS:
Art collection of methods and apparatus relating to the technology of stimulable phosphors which include for example, signal processing methods after image read-out and mechanical accessories for cassette or plate transport. These documents usually do not include as significant claim elements (or significant disclosure in the case of nonpatent literature) methods and apparatus relating to image recording or phosphor plate technology.

910 FOOD SAMPLE ANALYSIS USING INVISIBLE RADIANT ENERGY SOURCE:
This subclass is indented under the class definition. Subject matter wherein a sample being analyzed using invisible radiant energy is an edible substance.

END