

The following table contains both the IPC codes which appear in Inspec records (in **bold**) and their hierarchical context (in plain text). This context is necessary because the text for IPC codes is not always fully self-explanatory.

A	Section A - Human necessities
A01	Agriculture; Forestry; Animal husbandry; Hunting; Trapping; Fishing
A01B	Soil working in agriculture or forestry; Parts, details, or accessories of agricultural machines or implements, in general
A01D	Harvesting; Mowing
A01D34/00	Mowers; Mowing apparatus of harvesters
A01G	Horticulture; Cultivation of vegetables, flowers, rice, fruit, vines, hops, or seaweed; Forestry; Watering
A01G7/00	Botany in general
A01G9/00	Cultivation of flowers, vegetables or rice in receptacles, forcing-frames or greenhouses
A01G9/14	Greenhouses
A01G23/00	Forestry
A01G25/00	Watering gardens, fields, sports grounds, or the like
A01G25/16	Control of watering
A01J	Manufacture of dairy products
A01K	Animal husbandry; Care of birds, fishes, insects; Fishing; Rearing or breeding animals, not otherwise provided for; New breeds of animals
A01K61/00	Culture of fish, mussels, crayfish, lobsters, sponges, pearls, or the like
A01M	Catching, trapping or scaring of animals; Apparatus for the destruction of noxious animals or noxious plants
A01N	Preservation of bodies of humans or animals or plants or parts thereof; Biocides, e.g. as disinfectants, as pesticides or as herbicides; Pest repellants or attractants; Plant growth regulators
A01P	Biocidal, pest repellant, pest attractant or plant growth regulatory activity of chemical compounds or preparations
A01P17/00	Pest repellants
A21	Baking; Equipment for making or processing doughs; Doughs for baking
A23	Foods or foodstuffs; Their treatment, not covered by other classes
A23C	Dairy products, e.g. milk, butter, cheese; Milk or cheese substitutes; Making thereof
A23L	Foods, foodstuffs, or non-alcoholic beverages, not covered by subclasses a21d or a23b to a23j; Their preparation or treatment, e.g. cooking, modification of nutritive qualities, physical treatment; Preservation of foods or foodstuffs, in general
A23L1/00	Foods or foodstuffs; Their preparation or treatment
A23L2/00	Non-alcoholic beverages; Dry compositions or concentrates

	therefor; Their preparation
A23L3/00	Preservation of foods or foodstuffs, in general, e.g. pasteurising, sterilising, specially adapted for foods or foodstuffs
A24	Tobacco; Cigars; Cigarettes; Smokers' requisites
A41	Wearing apparel
A41D	Outerwear; Protective garments; Accessories
A41D13/00	Professional, industrial or sporting protective garments, e.g. garments affording protection against blows or punches, surgeons' gowns
A41H	Appliances or methods for making clothes, e.g. for dress-making, for tailoring, not otherwise provided for
A43	Footwear
A43D	Machines, tools, equipment or methods for manufacturing or repairing footwear
A47	Furniture; Domestic articles or appliances; Coffee mills; Spice mills; Suction cleaners in general
A47B	Tables; Desks; Office furniture; Cabinets; Drawers; General details of furniture
A61	Medical or veterinary science; Hygiene
A61B	Diagnosis; Surgery; Identification
A61B1/00	Instruments for performing medical examinations of the interior of cavities or tubes of the body by visual or photographic inspection, e.g. endoscopes; Illuminating arrangements therefor
A61B3/00	Apparatus for testing the eyes; Instruments for examining the eyes
A61B3/113	For determining or recording eye movement
A61B5/00	Measuring for diagnostic purposes; Identification of persons
A61B5/021	Measuring pressure in heart or blood vessels
A61B5/026	Measuring blood flow
A61B5/0402	Electrocardiography, i.e. ecg
A61B5/0476	Electroencephalography
A61B5/0488	Electromyography
A61B5/0496	Electro-oculography, e.g. detecting nystagmus
A61B5/055	Involving electronic [emr] or nuclear [nmr] magnetic resonance, e.g. magnetic resonance imaging
A61B6/00	Apparatus for radiation diagnosis, e.g. combined with radiation therapy equipment
A61B6/03	Computerised tomographs
A61B8/00	Diagnosis using ultrasonic, sonic or infrasonic waves
A61B8/14	Echo-tomography
A61B17/00	Surgical instruments, devices or methods, e.g. tourniquets
A61C	Dentistry; Apparatus or methods for oral or dental hygiene
A61F	Filters implantable into blood vessels; Prostheses; Devices providing

	patency to, or preventing collapsing of, tubular structures of the body, e.g. stents; Orthopaedic, nursing or contraceptive devices; Fomentation; Treatment or protection of eyes or ears; Bandages, dressings or absorbent pads; First-aid kits
A61F2/00	Filters implantable into blood vessels; Prostheses, i.e. artificial substitutes or replacements for parts of the body; Appliances for connecting them with the body; Devices providing patency to, or preventing collapsing of, tubular structures of the body, e.g. stents
A61F2/02	Prostheses implantable into the body
A61F2/18	Internal ear or nose parts, e.g. ear-drums
A61F2/50	Prostheses not implantable in the body
A61F5/00	Orthopaedic methods or devices for non-surgical treatment of bones or joints; Nursing devices
A61G	Transport, personal conveyances, or accommodation specially adapted for patients or disabled persons; Operating tables or chairs; Chairs for dentistry; Funeral devices
A61G5/00	Chairs or personal conveyances specially adapted for patients or disabled persons, e.g. wheelchairs
A61M	Devices for introducing media into, or onto, the body; Devices for transducing body media or for taking media from the body; Devices for producing or ending sleep or stupor
A61M25/00	Catheters; Hollow probes
A61N	Electrotherapy; Magnetotherapy; Radiation therapy; Ultrasound therapy
A61N1/00	Electrotherapy; Circuits therefor
A61N1/04	Electrodes
A61N1/36	For stimulation, e.g. heart pace-makers
A61N1/39	Heart defibrillators
A61N5/00	Radiation therapy
A61N7/00	Ultrasound therapy
A61P	Therapeutic activity of chemical compounds or medicinal preparations
A61Q	Use of cosmetics or similar toilet preparations
A62	Life-saving; Fire-fighting
A62B	Devices, apparatus or methods for life-saving
A62B7/00	Respiratory apparatus
A63	Sports; Games; Amusements
A63B	Apparatus for physical training, gymnastics, swimming, climbing, or fencing; Ball games; Training equipment
A63F	Card, board, or roulette games; Indoor games using small moving playing bodies; Games not otherwise provided for
A63F13/00	Aspects of games using an electronically generated display having two or more dimensions, e.g. on a television screen, showing representations related to the game
B	Section B - Performing operations; Transporting
B01	Physical or chemical processes or apparatus in general

B01B	Boiling; Boiling apparatus
B01B1/00	Boiling; Boiling apparatus for physical or chemical purposes
B01D	Separation
B01D1/00	Evaporating
B01D1/22	By bringing a thin layer of the liquid into contact with a heated surface
B01D3/00	Distillation or related exchange processes in which liquids are contacted with gaseous media, e.g. stripping
B01D3/14	Fractional distillation
B01D5/00	Condensation of vapours; Recovering volatile solvents by condensation
B01D7/00	Sublimation
B01D7/02	Crystallisation directly from the vapour phase
B01D9/00	Crystallisation
B01D15/00	Separating processes involving the treatment of liquids with solid sorbents; Apparatus therefor
B01D15/08	Selective adsorption, e.g. chromatography
B01D17/00	Separation of liquids, not provided for elsewhere, e.g. by thermal diffusion
B01D21/00	Separation of suspended solid particles from liquids by sedimentation
B01D21/01	Using flocculating agents
B01D37/00	Processes of filtration
B01D39/00	Filtering material for liquid or gaseous fluids
B01D39/10	Filter screens essentially made of metal
B01D53/00	Separation of gases or vapours; Recovering vapours of volatile solvents from gases; Chemical or biological purification of waste gases, e.g. engine exhaust gases, smoke, fumes, flue gases or aerosols
B01D53/48	Sulfur compounds
B01D57/00	Separation, other than separation of solids, not fully covered by a single other group or subclass, e.g. b03c
B01D57/02	By electrophoresis
B01D59/00	Separation of different isotopes of the same chemical element
B01D61/00	Processes of separation using semi-permeable membranes, e.g. dialysis, osmosis or ultrafiltration; Apparatus, accessories or auxiliary operations specially adapted therefor
B01D61/02	Reverse osmosis; Hyperfiltration
B01D61/14	Ultrafiltration; Microfiltration
B01F	Mixing, e.g. dissolving, emulsifying, dispersing
B01F1/00	Dissolving
B01F3/00	Mixing, e.g. dispersing, emulsifying, according to the phases to be mixed
B01J	Chemical or physical processes, e.g. catalysis, colloid

	chemistry; Their relevant apparatus
B01J6/00	Calcining; Fusing
B01J8/00	Chemical or physical processes in general, conducted in the presence of fluids and solid particles; Apparatus for such processes
B01J8/24	According to "fluidised-bed" technique
B01J13/00	Colloid chemistry, e.g. the production of colloidal materials or their solutions, not otherwise provided for; Making microcapsules or microballoons
B01J19/00	Chemical, physical, or physico-chemical processes in general; Their relevant apparatus
B01J19/06	Solidifying liquids
B01J47/00	Ion-exchange processes in general; Apparatus therefor
B01L	Chemical or physical laboratory apparatus for general use
B01L9/00	Supporting devices; Holding devices
B03	Separation of solid materials using liquids or using pneumatic tables or jigs; Magnetic or electrostatic separation of solid materials from solid materials or fluids; Separation by high-voltage electric fields
B03C	Magnetic or electrostatic separation of solid materials from solid materials or fluids; Separation by high-voltage electric fields
B03C1/00	Magnetic separation
B04	Centrifugal apparatus or machines for carrying-out physical or chemical processes
B04B	Centrifuges
B04C	Apparatus using free vortex flow, e.g. cyclones
B05	Spraying or atomising in general; Applying liquids or other fluent materials to surfaces, in general
B05D	Processes for applying liquids or other fluent materials to surfaces, in general
B05D1/00	Processes for applying liquids or other fluent materials
B05D1/02	Performed by spraying
B05D1/18	Performed by dipping
B06	Generating or transmitting mechanical vibrations in general
B06B	Generating or transmitting mechanical vibrations in general
B06B1/00	Processes or apparatus for generating mechanical vibrations of infrasonic, sonic or ultrasonic frequency
B06B1/02	Making use of electrical energy
B06B1/06	Operating with piezo-electric effect or with electrostriction
B07	Separating solids from solids; Sorting
B07B	Separating solids from solids by sieving, screening, or sifting or by using gas currents; Other separating by dry methods applicable to bulk material, e.g. loose articles fit to be handled like bulk material
B07B1/00	Sieving, screening, sifting, or sorting solid materials using networks, gratings, grids, or the like
B08	Cleaning

B08B	Cleaning in general; Prevention of fouling in general
B08B3/00	Cleaning by methods involving the use or presence of liquid or steam
B08B3/08	The liquid having chemical or dissolving effect
B08B3/12	By sonic or ultrasonic vibrations
B09	Disposal of solid waste; Reclamation of contaminated soil
B09B	Disposal of solid waste
B09B1/00	Dumping solid waste
B09B3/00	Destroying solid waste or transforming solid waste into something useful or harmless
B21	Mechanical metal-working without essentially removing material; Punching metal
B21B	Rolling of metal
B21B1/00	Metal rolling methods or mills for making semi-finished products of solid or profiled cross-section; Sequence of operations in milling trains; Layout of rolling-mill plant, e.g. grouping of stands; Succession of passes or of sectional pass alternations
B21C	Manufacture of metal sheets, wire, rods, tubes, profiles or like semi-manufactured products otherwise than by rolling; Auxiliary operations used in connection with metal-working without essentially removing material
B21C1/00	Manufacture of metal sheets, wire, rods, tubes or like semi-manufactured products by drawing
B21C23/00	Extruding metal; Impact extrusion
B21C47/00	Winding-up, coiling or winding-off metal wire, metal band or other flexible metal material characterised by features relevant to metal processing only
B21C47/02	Winding-up or coiling
B21D	Working or processing of sheet metal or metal tubes, rods or profiles without essentially removing material; Punching
B21D22/00	Shaping without cutting, by stamping, spinning, or deep-drawing
B21D22/20	Deep-drawing
B21D28/00	Shaping by press-cutting; Perforating
B21D28/02	Punching blanks or articles with or without obtaining scrap; Notching
B21D28/14	Dies
B21D28/24	Perforating, i.e. punching holes
B21J	Forging; Hammering; Pressing; Riveting; Forge furnaces
B21J5/00	Methods for forging, hammering, or pressing; Special equipment or accessories therefor
B21J7/00	Hammers; Forging machines with hammers or die jaws acting by impact
B21J9/00	Forging presses
B21J13/00	Details of machines for forging, pressing, or hammering

B21J13/02	Dies or mountings therefor
B21J15/00	Riveting
B22	Casting; Powder metallurgy
B22C	Foundry moulding
B22C9/00	Moulds or cores; Moulding processes
B22C9/02	Sand moulds or like moulds for shaped castings
B22C9/04	Use of lost patterns
B22C9/06	Permanent moulds for shaped castings
B22C25/00	Foundry moulding plants
B22D	Casting of metals; Casting of other substances by the same processes or devices
B22D13/00	Centrifugal casting; Casting by using centrifugal force
B22D17/00	Pressure die casting or injection die casting, i.e. casting in which the metal is forced into a mould under high pressure
B22D18/00	Pressure casting; Vacuum casting
B22D18/06	Vacuum casting, i.e. making use of vacuum to fill the mould
B22D47/00	Casting plants
B22F	Working metallic powder; Manufacture of articles from metallic powder; Making metallic powder
B23	Machine tools; Metal-working not otherwise provided for
B23B	Turning; Boring
B23B1/00	Methods for turning or working essentially requiring the use of turning-machines; Use of auxiliary equipment in connection with such methods
B23B3/00	General-purpose turning-machines or devices, e.g. centre lathes with feed rod and lead screw; Sets of turning-machines
B23B35/00	Methods for boring or drilling, or for working essentially requiring the use of boring or drilling machines; Use of auxiliary equipment in connection with such methods
B23B39/00	General-purpose boring or drilling machines or devices; Sets of boring or drilling machines
B23C	Milling
B23C1/00	Milling machines not designed for particular work or special operations
B23C3/00	Milling particular work; Special milling operations; Machines therefor
B23C3/12	Trimming or finishing edges, e.g. deburring welded corners
B23D	Planing; Slotting; Shearing; Broaching; Sawing; Filing; Scraping; Like operations for working metal by removing material, not otherwise provided for
B23D15/00	Shearing machines or shearing devices cutting by blades which move parallel to each other
B23D37/00	Broaching machines or broaching devices
B23F	Making gears or toothed racks

B23G	Thread cutting; Working of screws, bolt heads, or nuts, in conjunction therewith
B23H	Working of metal by the action of a high concentration of electric current on a workpiece using an electrode which takes the place of a tool; Such working combined with other forms of working of metal
B23H1/00	Electrical discharge machining, i.e. removing metal with a series of rapidly recurring electrical discharges between an electrode and a workpiece in the presence of a fluid dielectric
B23H3/00	Electrochemical machining, i.e. removing metal by passing current between an electrode and a workpiece in the presence of an electrolyte
B23K	Soldering or unsoldering; Welding; Cladding or plating by soldering or welding; Cutting by applying heat locally, e.g. flame cutting; Working by laser beam
B23K1/00	Soldering, e.g. brazing, or unsoldering
B23K9/00	Arc welding or cutting
B23K9/013	Arc cutting, gouging, scarfing or desurfacing
B23K10/00	Welding or cutting by means of a plasma
B23K10/02	Plasma welding
B23K11/00	Resistance welding; Severing by resistance heating
B23K11/02	Pressure butt welding
B23K11/04	Flash butt welding
B23K11/11	Spot welding
B23K15/00	Electron-beam welding or cutting
B23K15/08	Removing material, e.g. by cutting, by hole drilling
B23K20/00	Non-electric welding by applying impact or other pressure, with or without the application of heat, e.g. cladding or plating
B23K20/10	Making use of vibrations, e.g. ultrasonic welding
B23K20/12	The heat being generated by friction; Friction welding
B23K25/00	Slag welding, i.e. using a heated layer or mass of powder, slag, or the like in contact with the material to be joined
B23K26/00	Working by laser beam, e.g. welding, cutting, boring
B23K35/00	Rods, electrodes, materials, or media, for use in soldering, welding, or cutting
B23P	Other working of metal; Combined operations; Universal machine tools
B23P11/00	Connecting or disconnecting metal parts or objects by metal-working techniques, not otherwise provided for
B23P11/02	By first expanding and then shrinking or vice versa, e.g. by using pressure fluids; By making force fits
B23Q	Details, components, or accessories for machine tools, e.g. arrangements for copying or controlling; Machine tools in general, characterised by the construction of particular details or components; Combinations or associations of metal-working machines, not directed to a particular result

B23Q3/00	Devices holding, supporting, or positioning, work or tools, of a kind normally removable from the machine
B23Q3/06	Work-clamping means
B23Q15/00	Automatic control or regulation of feed movement, cutting velocity or position of tool or work
B24	Grinding; Polishing
B24B	Machines, devices, or processes for grinding or polishing; Dressing or conditioning of abrading surfaces; Feeding of grinding, polishing, or lapping agents
B24B1/00	Processes of grinding or polishing; Use of auxiliary equipment in connection with such processes
B24C	Abrasive or related blasting with particulate material
B24C1/00	Methods for use of abrasive blasting for producing particular effects; Use of auxiliary equipment in connection with such methods
B24C1/10	For compacting surfaces, e.g. shot-peening
B24D	Tools for grinding, buffing, or sharpening
B24D3/00	Physical features of abrasive bodies, or sheets, e.g. abrasive surfaces of special nature; Abrasive bodies or sheets characterised by their constituents
B25	Hand tools; Portable power-driven tools; Handles for hand implements; Workshop equipment; Manipulators
B25B	Tools or bench devices not otherwise provided for, for fastening, connecting, disengaging, or holding
B25B1/00	Vices
B25B5/00	Clamps
B25B27/00	Hand tools or bench devices, specially adapted for fitting together or separating parts or objects whether or not involving some deformation, not otherwise provided for
B25B27/02	For connecting objects by press fit or detaching same
B25J	Manipulators; Chambers provided with manipulation devices
B25J7/00	Micromanipulators
B25J15/00	Gripping heads
B25J15/08	Having finger members
B26	Hand cutting tools; Cutting; Severing
B26D	Cutting; Details common to machines for severing, e.g. by cutting, perforating, punching, stamping-out
B26F	Perforating; Punching; Cutting-out; Stamping-out; Severing by means other than cutting
B27	Working or preserving wood or similar material; Nailing or stapling machines in general
B27M	Working of wood not provided for in subclasses b27b to b27l; Manufacture of specific wooden articles
B27M3/00	Manufacture or reconditioning of specific semi-finished or finished articles
B27M3/18	Of furniture

B28	Working cement, clay, or stone
B29	Working of plastics; Working of substances in a plastic state in general
B29C	Shaping or joining of plastics; Shaping of substances in a plastic state, in general; After- treatment of the shaped products, e.g. repairing
B29C43/00	Compression moulding, i.e. applying external pressure to flow the moulding material; Apparatus therefor
B29C45/00	Injection moulding, i.e. forcing the required volume of moulding material through a nozzle into a closed mould; Apparatus therefor
B29C45/02	Transfer moulding, i.e. transferring the required volume of moulding material by a plunger from a "shot" cavity into a mould cavity
B29C49/00	Blow-moulding, i.e. blowing a preform or parison to a desired shape within a mould; Apparatus therefor
B29C51/00	Shaping by thermoforming, e.g. shaping sheets in matched moulds or by deep-drawing; Apparatus therefor
B29D	Producing particular articles from plastics or from substances in a plastic state
B30	Presses
B30B	Presses in general; Presses not otherwise provided for
B31	Making paper articles; Working paper
B32	Layered products
B32B	Layered products, i.e. products built-up of strata of flat or non-flat, e.g. cellular or honeycomb, form
B32B3/00	Layered products essentially comprising a layer with external or internal discontinuities or unevennesses, or a layer of non-planar form; Layered products essentially having particular features of form
B32B3/12	Characterised by a layer of regularly-arranged cells whether integral or formed individually or by conjunction of separate strips, e.g. honeycomb structure
B32B15/00	Layered products essentially comprising metal
B32B15/01	All layers being exclusively metallic
B41	Printing; Lining machines; Typewriters; Stamps
B41B	Machines or accessories for making, setting, or distributing type; Type; Photographic or photoelectronic composing devices
B41F	Printing machines or presses
B41J	Typewriters; Selective printing mechanisms, i.e. mechanisms printing otherwise than from a forme; Correction of typographical errors
B41J2/00	Typewriters or selective printing mechanisms characterised by the printing or marking process for which they are designed
B41J2/01	Ink jet
B60	Vehicles in general

B60B	Vehicle wheels; Castors; Axles; Increasing wheel adhesion
B60B35/00	Axle units; Parts thereof
B60C	Vehicle tyres; Tyre inflation; Tyre changing; Connecting valves to inflatable elastic bodies in general; Devices or arrangements related to tyres
B60G	Vehicle suspension arrangements
B60K	Arrangement or mounting of propulsion units or of transmissions in vehicles; Arrangement or mounting of plural diverse prime-movers; Auxiliary drives; Instrumentation or dashboards for vehicles; Arrangements in connection with cooling, air intake, gas exhaust, or fuel supply, of propulsion units, in vehicles
B60L	Electric equipment or propulsion of electrically-propelled vehicles; Magnetic suspension or levitation for vehicles; Electrodynamic brake systems for vehicles, in general
B60L1/00	Supplying electric power to auxiliary equipment of vehicles
B60L3/00	Electric devices on electrically-propelled vehicles for safety purposes; Monitoring operating variables, e.g. speed, deceleration, power consumption
B60L5/00	Current-collectors for power supply lines of electrically-propelled vehicles
B60L7/00	Electrodynamic brake systems for vehicles in general
B60L8/00	Electric propulsion with power supply from force of nature, e.g. sun, wind
B60L11/00	Electric propulsion with power supplied within the vehicle
B60L11/02	Using engine-driven generators
B60L11/18	Using power supplied from primary cells, secondary cells, or fuel cells
B60L13/00	Electric propulsion for monorail vehicles, suspension vehicles or rack railways; Magnetic suspension or levitation for vehicles
B60L13/04	Magnetic suspension or levitation for vehicles
B60M	Power supply lines, or devices along rails, for electrically-propelled vehicles
B60M1/00	Power supply lines for contact with collector on vehicle
B60M3/00	Feeding power to the supply lines in contact with collector on vehicles; Arrangements for consuming regenerative power
B60P	Vehicles adapted for load transportation or to transport, to carry, or to comprise special loads or objects
B60P1/00	Vehicles predominantly for transporting loads and modified to facilitate loading, consolidating the load, or unloading
B60P1/02	With parallel up-and-down movement of load supporting or containing element
B60T	Vehicle brake control systems or parts thereof; Brake control systems or parts thereof, in general; Arrangement of braking elements on vehicles in general; Portable devices for preventing unwanted movement of vehicles; Vehicle

	modifications to facilitate cooling of brakes
B60T1/00	Arrangements of braking elements, i.e. of those parts where braking effect occurs
B60V	Air-cushion vehicles
B60V1/00	Air-cushion vehicles
B60W	Conjoint control of vehicle sub-units of different type or different function; Control systems specially adapted for hybrid vehicles; Road vehicle drive control systems for purposes not related to the control of a particular sub-unit
B61	Railways
B61B	Railway systems; Equipment therefor not otherwise provided for
B61C	Locomotives; Motor railcars
B61C1/00	Steam locomotives or railcars
B61C3/00	Electric locomotives or railcars
B61C5/00	Locomotives or motor railcars with ic engines or gas turbines
B61C17/00	Arrangement or disposition of parts; Details or accessories not otherwise provided for; Use of control gear and control systems
B61D	Body details or kinds of railway vehicles
B61F	Rail vehicle suspensions, e.g. underframes, bogies, arrangements of wheel axles; Rail vehicles for use on tracks of different width; Preventing derailing; Wheels guards; Obstruction removers or the like
B61L	Guiding railway traffic; Ensuring the safety of railway traffic
B62	Land vehicles for travelling otherwise than on rails
B62D	Motor vehicles; Trailers
B62D1/00	Steering controls, i.e. means for initiating a change of direction of the vehicle
B62D55/00	Endless-track vehicles
B62D65/00	Designing, manufacturing, e.g. assembling, facilitating disassembly, or structurally modifying motor vehicles or trailers, not otherwise provided for
B62K	Cycles; Cycle frames; Cycle steering devices; Rider-operated terminal controls specially adapted for cycles; Cycle axle suspensions; Cycle sidecars, forecars, or the like
B62K3/00	Bicycles
B62K11/00	Motorcycles; Engine-assisted cycles; Motor-scooters
B62M	Rider propulsion of wheeled vehicles or sledges; Powered propulsion of sledges or cycles; Transmissions specially adapted for such vehicles
B62M7/00	Motorcycles or cycles with auxiliary engines characterised by position of engine
B63	Ships or other waterborne vessels; Related equipment
B63B	Ships or other waterborne vessels; Equipment for shipping
B63B9/00	Methods of designing, building, maintaining, converting,

	refitting, repairing, or determining properties of, vessels, not otherwise provided for
B63B35/00	Vessels or like floating structures adapted for special purposes
B63B35/44	Floating buildings, stores, drilling platforms, or workshops, e.g. carrying water-oil separating devices
B63B43/00	Improving safety of vessels, e.g. damage control, not otherwise provided for
B63G	Offensive or defensive arrangements on vessels; Mine-laying; Mine-sweeping; Submarines; Aircraft carriers
B63G8/00	Underwater vessels, e.g. submarines
B63H	Marine propulsion or steering
B64	Aircraft; Aviation; Cosmonautics
B64B	Lighter-than-air aircraft
B64B1/00	Lighter-than-air aircraft
B64C	Aeroplanes; Helicopters
B64C13/00	Control systems or transmitting systems for actuating flying-control surfaces, lift-increasing flaps, air brakes, or spoilers
B64C15/00	Attitude, flight direction, or altitude control by jet reaction
B64C27/00	Rotorcraft; Rotors peculiar thereto
B64D	Equipment for fitting in or to aircraft; Flying suits; Parachutes; Arrangements or mounting of power plants or propulsion transmissions
B64D7/00	Arrangement of military equipment, e.g. armaments, armament accessories, or military shielding, in aircraft; Adaptations of armament mountings for aircraft
B64D43/00	Arrangements or adaptations of instruments
B64F	Ground or aircraft-carrier-deck installations
B64F5/00	Designing, manufacturing, assembling, cleaning, maintaining, or repairing aircraft, not otherwise provided for
B64G	Cosmonautics; Vehicles or equipment therefor
B64G1/00	Cosmonautic vehicles
B64G1/24	Guiding or controlling apparatus, e.g. for attitude control
B64G1/42	Arrangements or adaptations of power supply systems
B64G5/00	Ground equipment for vehicles, e.g. starting towers, fuelling arrangements
B65	Conveying; Packing; Storing; Handling thin or filamentary material
B65B	Machines, apparatus or devices for, or methods of, packaging articles or materials; Unpacking
B65B11/00	Wrapping, e.g. partially or wholly enclosing, articles, or quantities of material, in strips, sheets, or blanks, of flexible material
B65B13/00	Bundling articles
B65B27/00	Bundling particular articles presenting special problems using string, wire, or narrow tape or band; Baling fibrous

	material, e.g. peat, not otherwise provided for
B65C	Labelling or tagging machines, apparatus, or processes
B65D	Containers for storage or transport of articles or materials, e.g. bags, barrels, bottles, boxes, cans, cartons, crates, drums, jars, tanks, hoppers, forwarding containers; Accessories, closures, or fittings therefor; Packaging elements; Packages
B65D19/00	Pallets or like platforms, with or without side walls, for supporting loads to be lifted or lowered
B65D30/00	Sacks, bags or like containers
B65D81/00	Containers, packaging elements, or packages, for contents presenting particular transport or storage problems, or adapted to be used for non-packaging purposes after removal of contents
B65D81/18	Providing specific environment for contents, e.g. temperature above or below ambient
B65D88/00	Large containers
B65F	Gathering or removal of domestic or like refuse
B65G	Transport or storage devices, e.g. conveyers for loading or tipping; Shop conveyer systems; Pneumatic tube conveyers
B65G1/00	Storing articles, individually or in orderly arrangement, in warehouses or magazines
B65G3/00	Storing bulk material or loose, i.e. disorderly, articles
B65G57/00	Stacking of articles
B65G65/00	Loading or unloading
B65H	Handling thin or filamentary material, e.g. sheets, webs, cables
B65H54/00	Winding, coiling, or depositing filamentary material
B66	Hoisting; Lifting; Hauling
B66B	Elevators; Escalators or moving walkways
B66C	Cranes; Load-engaging elements or devices for cranes, capstans, winches, or tackles
B66D	Capstans; Winches; Tackles, e.g. pulley blocks; Hoists
B66F	Hoisting, lifting, hauling, or pushing, not otherwise provided for, e.g. devices which apply a lifting or pushing force directly to the surface of a load
B66F9/00	Devices for lifting or lowering bulky or heavy goods for loading or unloading purposes
B66F9/06	Movable, with their loads, on wheels or the like, e.g. fork-lift trucks
B67	Opening or closing bottles, jars or similar containers; Liquid handling
B67C	Filling with liquids or semiliquids, or emptying, of bottles, jars, cans, casks, barrels, or similar containers, not otherwise provided for; Funnels
B68	Saddlery; Upholstery
B68F	Making articles from leather, canvas, or the like
B81	Micro-structural technology

B81B	Micro-structural devices or systems, e.g. micro-mechanical devices
B81C	Processes or apparatus specially adapted for the manufacture or treatment of micro-structural devices or systems
B81C1/00	Manufacture or treatment of devices or systems in or on a substrate
B81C3/00	Assembling of devices or systems from individually processed components
B82	Nano-technology
B82B	Nano-structures; Manufacture or treatment thereof
B82B1/00	Nano-structures
B82B3/00	Manufacture or treatment of nano-structures
C	Section C - Chemistry; Metallurgy
C01	Inorganic chemistry
C01B	Non-metallic elements; Compounds thereof
C01B3/00	Hydrogen; Gaseous mixtures containing hydrogen; Separation of hydrogen from mixtures containing it; Purification of hydrogen
C02	Treatment of water, waste water, sewage, or sludge
C02F	Treatment of water, waste water, sewage, or sludge
C02F11/00	Treatment of sludge; Devices therefor
C03	Glass; Mineral or slag wool
C03B	Manufacture or shaping of glass, or of mineral or slag wool; Supplementary processes in the manufacture or shaping of glass, or of mineral or slag wool
C03B37/00	Manufacture or treatment of flakes, fibres, or filaments from softened glass, minerals, or slags
C03B37/01	Manufacture of glass fibres or filaments
C03C	Chemical composition of glasses, glazes, or vitreous enamels; Surface treatment of glass; Surface treatment of fibres or filaments from glass, minerals or slags; Joining glass to glass or other materials
C03C3/00	Glass compositions
C03C8/00	Enamels; Glazes; Fusion seal compositions being frit compositions having non-frit additions
C03C10/00	Devitrified glass ceramics, i.e. glass ceramics having a crystalline phase dispersed in a glassy phase and constituting at least 50% by weight of the total composition
C03C25/00	Surface treatment of fibres or filaments from glass, minerals, or slags
C03C25/10	By coating
C04	Cements; Concrete; Artificial stone; Ceramics; Refractories
C04B	Lime; Magnesia; Slag; Cements; Compositions thereof, e.g. mortars, concrete or like building materials; Artificial stone; Ceramics; Refractories; Treatment of natural stone
C04B33/00	Clay-wares

C04B35/00	Shaped ceramic products characterised by their composition; Ceramic compositions; Processing powders of inorganic compounds preparatory to the manufacturing of ceramic products
C05	Fertilisers; Manufacture thereof
C06	Explosives; Matches
C06B	Explosive or thermic compositions; Manufacture thereof; Use of single substances as explosives
C06C	Detonating or priming devices; Fuses; Chemical lighters; Pyrophoric compositions
C08	Organic macromolecular compounds; Their preparation or chemical working-up; Compositions based thereon
C08C	Treatment or chemical modification of rubbers
C08F	Macromolecular compounds obtained by reactions only involving carbon-to-carbon unsaturated bonds
C08F2/00	Processes of polymerisation
C08J	Working-up; General processes of compounding; After-treatment not covered by subclasses c08b, c08c, c08f, c08g or c08h
C08J3/00	Processes of treating or compounding macromolecular substances
C08J3/24	Crosslinking, e.g. vulcanising, of macromolecules
C08L	Compositions of macromolecular compounds
C08L91/00	Compositions of oils, fats or waxes; Compositions of derivatives thereof
C08L95/00	Compositions of bituminous materials, e.g. asphalt, tar, pitch
C09	Dyes; Paints; Polishes; Natural resins; Adhesives; Compositions not otherwise provided for; Applications of materials not otherwise provided for
C09B	Organic dyes or closely-related compounds for producing dyes; Mordants; Lakes
C09C	Treatment of inorganic materials, other than fibrous fillers, to enhance their pigmenting or filling properties; Preparation of carbon black
C09D	Coating compositions, e.g. paints, varnishes, lacquers; Filling pastes; Chemical paint or ink removers; Inks; Correcting fluids; Woodstains; Pastes or solids for colouring or printing; Use of materials therefor
C09D11/00	Inks
C09D11/00	Coating compositions based on cellulose, modified cellulose, or cellulose derivatives
C09J	Adhesives; Adhesive processes in general (non-mechanical part); Adhesive processes not provided for elsewhere; Use of materials as adhesives
C09J5/00	Adhesive processes in general; Adhesive processes not provided for elsewhere
C09J9/00	Adhesives characterised by their physical nature or the effects produced
C09K	Materials for applications not otherwise provided for; Applications of

	materials not otherwise provided for
C09K3/00	Materials not provided for elsewhere
C09K3/10	For sealing or packing joints or covers
C09K5/00	Heat-transfer, heat-exchange or heat-storage materials, e.g. refrigerants; Materials for the production of heat or cold by chemical reactions other than by combustion
C09K11/00	Luminescent, e.g. electroluminescent, chemiluminescent, materials
C09K15/00	Anti-oxidant compositions; Compositions inhibiting chemical change
C09K19/00	Liquid crystal materials
C09K19/04	Characterised by the chemical structure of the liquid crystal components
C09K19/38	Polymers, e.g. polyamides
C09K21/00	Fireproofing materials
C10	Petroleum, gas or coke industries; Technical gases containing carbon monoxide; Fuels; Lubricants; Peat
C10B	Destructive distillation of carbonaceous materials for production of gas, coke, tar, or similar materials
C10C	Working-up tar, pitch, asphalt, bitumen; Pyroligneous acid
C10G	Cracking hydrocarbon oils; Production of liquid hydrocarbon mixtures, e.g. by destructive hydrogenation, oligomerisation, polymerisation; Recovery of hydrocarbon oils from oil-shale, oil-sand, or gases; Refining mixtures mainly consisting of hydrocarbons; Reforming of naphtha; Mineral waxes
C10L	Fuels not otherwise provided for; Natural gas; Synthetic natural gas obtained by processes not covered by subclasses c10g to or c10k; Liquefied petroleum gas; use of additives to fuels or fires; fire-lighters
C10L3/00	Gaseous fuels; Natural gas; Synthetic natural gas obtained by processes not covered by subclasses c10g, c10k; Liquefied petroleum gas
C10M	Lubricating compositions; Use of chemical substances either alone or as lubricating ingredients in a lubricating composition
C11	Animal or vegetable oils, fats, fatty substances or waxes; Fatty acids therefrom; Detergents; Candles
C11B	Producing, e.g. by pressing raw materials or by extraction from waste materials, refining or preserving fats, fatty substances, e.g. lanolin, fatty oils or waxes; Essential oils; Perfumes
C11B9/00	Essential oils; Perfumes
C11D	Detergent compositions; Use of single substances as detergents; Soap or soap-making; Resin soaps; Recovery of glycerol
C12	Biochemistry; Beer; Spirits; Wine; Vinegar; Microbiology; Enzymology; Mutation or genetic engineering
C12C	Brewing of beer

C12G	Wine; Other alcoholic beverages; Preparation thereof
C12G1/00	Preparation of wine or sparkling wine
C12M	Apparatus for enzymology or microbiology
C12M3/00	Tissue, human, animal or plant cell, or virus culture apparatus
C12N	Micro-organisms or enzymes; Compositions thereof; Propagating, preserving, or maintaining micro-organisms; Mutation or genetic engineering; Culture media
C13	Sugar industry
C14	Skins; Hides; Pelts; Leather
C14C	Chemical treatment of hides, skins or leather, e.g. tanning, impregnating, finishing; Apparatus therefor; Compositions for tanning
C14C3/00	Tanning; Compositions for tanning
C21	Metallurgy of iron
C21B	Manufacture of iron or steel
C21B7/00	Blast furnaces
C21C	Processing of pig-iron, e.g. refining, manufacture of wrought-iron or steel; Treatment in molten state of ferrous alloys
C21D	Modifying the physical structure of ferrous metals; General devices for heat treatment of ferrous or non-ferrous metals or alloys; Making metal malleable by decarburisation, tempering, or other treatments
C21D1/00	General methods or devices for heat treatment, e.g. annealing, hardening, quenching, tempering
C21D1/02	Hardening articles or materials formed by forging or rolling, with no further heating beyond that required for the formation
C21D1/04	With simultaneous application of supersonic waves, magnetic or electric fields
C21D1/06	Surface hardening
C21D1/09	By direct application of electrical or wave energy; By particle radiation
C21D1/18	Hardening; Quenching with or without subsequent tempering
C21D1/26	Methods of annealing
C21D1/62	Quenching devices
C21D8/00	Modifying the physical properties by deformation combined with, or followed by, heat treatment
C22	Metallurgy; Ferrous or non-ferrous alloys; Treatment of alloys or non-ferrous metals
C22B	Production or refining of metals; Pretreatment of raw materials
C22C	Alloys
C22C1/00	Making non-ferrous alloys
C22C1/04	By powder metallurgy

C22C5/00	Alloys based on noble metals
C22C5/06	Alloys based on silver
C22C7/00	Alloys based on mercury
C22C9/00	Alloys based on copper
C22C11/00	Alloys based on lead
C22C12/00	Alloys based on antimony or bismuth
C22C13/00	Alloys based on tin
C22C14/00	Alloys based on titanium
C22C16/00	Alloys based on zirconium
C22C18/00	Alloys based on zinc
C22C19/00	Alloys based on nickel or cobalt
C22C20/00	Alloys based on cadmium
C22C21/00	Alloys based on aluminium
C22C22/00	Alloys based on manganese
C22C23/00	Alloys based on magnesium
C22C24/00	Alloys based on an alkali or an alkaline earth metal
C22C25/00	Alloys based on beryllium
C22C27/00	Alloys based on rhenium or a refractory metal not mentioned in groups C22C14/00 or C22C16/00
C22C29/00	Alloys based on carbides, oxides, borides, nitrides or silicides, e.g. cermets, or other metal compounds, e. g. oxynitrides, sulfides
C22C33/00	Making ferrous alloys
C22C33/02	By powder metallurgy
C22C38/00	Ferrous alloys, e.g. steel alloys
C22C45/00	Amorphous alloys
C22F	Changing the physical structure of non-ferrous metals or non-ferrous alloys
C22F1/00	Changing the physical structure of non-ferrous metals or alloys by heat treatment or by hot or cold working
C23	Coating metallic material; Coating material with metallic material; Chemical surface treatment; Diffusion treatment of metallic material; Coating by vacuum evaporation, by sputtering, by ion implantation or by chemical vapour deposition, in general; Inhibiting corrosion of metallic material or incrustation in general
C23C	Coating metallic material; Coating material with metallic material; Surface treatment of metallic material by diffusion into the surface, by chemical conversion or substitution; Coating by vacuum evaporation, by sputtering, by ion implantation or by chemical vapour deposition, in general
C23C2/00	Hot-dipping or immersion processes for applying the coating material in the molten state without affecting the shape; Apparatus therefor
C23C4/00	Coating by spraying the coating material in the molten state, e.g. by flame, plasma or electric discharge

C23C14/00	Coating by vacuum evaporation, by sputtering or by ion implantation of the coating forming material
C23C14/24	Vacuum evaporation
C23C14/34	Sputtering
C23C14/46	By ion beam produced by an external ion source
C23C16/00	Chemical coating by decomposition of gaseous compounds, without leaving reaction products of surface material in the coating, i.e. chemical vapour deposition (cvd) processes
C23C16/18	From metallo-organic compounds
C23C16/48	By irradiation, e.g. photolysis, radiolysis, particle radiation
C23C16/50	Using electric discharges
C23C18/00	Chemical coating by decomposition of either liquid compounds or solutions of the coating forming compounds, without leaving reaction products of surface material in the coating; Contact plating
C23C18/16	By reduction or substitution, i.e. electroless plating
C23F	Non-mechanical removal of metallic material from surfaces; Inhibiting corrosion of metallic material; Inhibiting incrustation in general; Multi-step processes for surface treatment of metallic material involving at least one process provided for in class c23 and at least one process covered by subclass c21d or c22f or class c25
C23F11/00	Inhibiting corrosion of metallic material by applying inhibitors to the surface in danger of corrosion or adding them to the corrosive agent
C23F13/00	Inhibiting corrosion of metals by anodic or cathodic protection
C23G	Cleaning or de-greasing of metallic material by chemical methods other than electrolysis
C23G1/00	Cleaning or pickling metallic material with solutions or molten salts
C25	Electrolytic or electrophoretic processes; Apparatus therefor
C25B	Electrolytic or electrophoretic processes for the production of compounds or non- metals; Apparatus therefor
C25B11/00	Electrodes; Manufacture thereof not otherwise provided for
C25C	Processes for the electrolytic production, recovery or refining of metals; Apparatus therefor
C25D	Processes for the electrolytic or electrophoretic production of coatings; Electroforming; Joining workpieces by electrolysis; Apparatus therefor
C25D1/00	Electroforming
C25D5/00	Electroplating characterised by the process; Pretreatment or after-treatment of workpieces
C25D11/00	Electrolytic coating by surface reaction, i.e. forming conversion layers
C25D11/02	Anodisation
C25D13/00	Electrophoretic coating

C25D17/00	Constructional parts, or assemblies thereof, of cells for electrolytic coating
C25D17/10	Electrodes
C25F	Processes for the electrolytic removal of materials from objects; Apparatus therefor
C25F3/00	Electrolytic etching or polishing
C30	Crystal growth
C30B	Single-crystal growth; Unidirectional solidification of eutectic material or unidirectional demixing of eutectoid material; Refining by zone-melting of material; Production of a homogeneous polycrystalline material with defined structure; Single crystals or homogeneous polycrystalline material with defined structure; After-treatment of single crystals or a homogeneous polycrystalline material with defined structure; Apparatus therefor
C30B1/00	Single-crystal growth directly from the solid state
C30B5/00	Single-crystal growth from gels
C30B7/00	Single-crystal growth from solutions using solvents which are liquid at normal temperature, e.g. aqueous solutions
C30B9/00	Single-crystal growth from melt solutions using molten solvents
C30B11/00	Single-crystal-growth by normal freezing or freezing under temperature gradient, e.g. bridgman- stockbarger method
C30B13/00	Single-crystal growth by zone-melting; Refining by zone-melting
C30B15/00	Single-crystal growth by pulling from a melt, e.g. czochralski method
C30B19/00	Liquid-phase epitaxial-layer growth
C30B21/00	Unidirectional solidification of eutectic materials
C30B23/00	Single-crystal growth by condensing evaporated or sublimed materials
C30B23/02	Epitaxial-layer growth
C30B25/00	Single-crystal growth by chemical reaction of reactive gases, e.g. chemical vapour deposition growth
C30B25/02	Epitaxial-layer growth
C30B31/00	Diffusion or doping processes for single crystals or homogeneous polycrystalline material with defined structure; Apparatus therefor
D	Section D - Textiles; Paper
D01	Natural or artificial threads or fibres; Spinning
D01C	Chemical treatment of natural filamentary or fibrous material to obtain filaments or fibres for spinning; Carbonising rags to recover animal fibres
D01C3/00	Treatment of animal material, e.g. chemical scouring of wool
D01H	Spinning or twisting
D02	Yarns; Mechanical finishing of yarns or ropes; Warping or beaming

D03	Weaving
D03D	Woven fabrics; Methods of weaving; Looms
D03D7/00	Woven fabrics designed to be resilient, i.e. to recover from compressive stress
D04	Braiding; Lace-making; Knitting; Trimmings; Non-woven fabrics
D04B	Knitting
D04G	Making nets by knotting of filamentary material; Making knotted carpets or tapestries; Knotting not otherwise provided for
D04G3/00	Making knotted carpets or tapestries
D04H	Making textile fabrics, e.g. from fibres or filamentary material; Fabrics made by such processes or apparatus, e.g. felts, non-woven fabrics; Cotton-wool; Wadding
D05	Sewing; Embroidering; Tufting
D05B	Sewing
D06	Treatment of textiles or the like; Laundering; Flexible materials not otherwise provided for
D06F	Laundering, drying, ironing, pressing or folding textile articles
D06L	Bleaching, e.g. optical bleaching, dry-cleaning, or washing fibres, threads, yarns, fabrics, feathers, or made-up fibrous goods; Bleaching leather or furs
D06L3/00	Bleaching fibres, threads, yarns, fabrics, feathers, or made-up fibrous goods, leather, or furs
D06P	Dyeing or printing textiles; Dyeing leather, furs, or solid macromolecular substances in any form
D06P1/00	General processes of dyeing or printing textiles, or general processes of dyeing leather, furs, or solid macromolecular substances in any form, classified according to the dyes, pigments, or auxiliary substances employed
D06P1/44	Using insoluble pigments or auxiliary substances, e.g. binders
D07	Ropes; Cables other than electric
D21	Paper-making; Production of cellulose
D21C	Production of cellulose by removing non-cellulose substances from cellulose-containing materials; Regeneration of pulping liquors; Apparatus therefor
D21D	Treatment of the materials before passing to the paper-making machine
D21F	Paper-making machines; Methods of producing paper thereon
D21G	Calenders; Accessories for paper-making machines
D21H	Pulp compositions; Preparation thereof not covered by subclasses d21c, d21d; Impregnating or coating of paper; Treatment of finished paper not covered by class b31 or subclass d21g; Paper not otherwise provided for
D21J	Fibreboard; Manufacture of articles from cellulosic fibrous suspensions or from papier-mache

E	Section E - Fixed constructions
E01	Construction of roads, railways, or bridges
E01B	Permanent way; Permanent-way tools; Machines for making railways of all kinds
E01C	Construction of, or surfaces for, roads, sports grounds, or the like; Machines or auxiliary tools for construction or repair
E01C23/00	Auxiliary devices or arrangements for constructing, repairing, reconditioning, or taking-up road or like surfaces
E01D	Bridges
E02	Hydraulic engineering; Foundations; Soil-shifting
E02B	Hydraulic engineering
E02B3/00	Engineering work in connection with control or use of streams, rivers, coasts, or other marine sites; Sealings or joints for engineering work in general
E02B3/10	Dams; Dykes; Sluice ways or other structures for dykes, dams, or the like
E02B13/00	Irrigation ditches, i.e. gravity flow, open channel water distribution systems
E02D	Foundations; Excavations; Embankments; Underground or underwater structures
E02D29/00	Underground or underwater structures; Retaining walls
E02F	Dredging; Soil-shifting
E03	Water supply; Sewerage
E03C	Domestic plumbing installations for fresh water or waste water; Sinks
E03F	Sewers; Cesspools
E04	Building
E04B	General building constructions; Walls, e.g. partitions; Roofs; Floors; Ceilings; Insulation or other protection of buildings
E04B1/00	Constructions in general; Structures which are not restricted either to walls, e.g. partitions, or floors or ceilings or roofs
E04B1/343	Structures characterised by movable, separable, or collapsible parts, e.g. for transport
E04B1/64	For making damp-proof; Protection against corrosion
E04B1/66	Sealings
E04B1/94	Against fire
E04B1/98	Against vibrations or shocks; Against mechanical destruction, e.g. by air-raids
E04B1/99	Room acoustics, i.e. forms of, or arrangements in, rooms for influencing or directing sound
E04B2/00	Walls, e.g. partitions, for buildings; Wall construction with regard to insulation; Connections specially adapted to walls
E04B5/00	Floors; Floor construction with regard to insulation; Connections specially adapted therefor
E04B7/00	Roofs; Roof construction with regard to insulation

E04B9/00	Ceilings; Construction of ceilings, e.g. false ceilings; Ceiling construction with regard to insulation
E04C	Structural elements; Building materials
E04C1/00	Building elements of block or other shape for the construction of parts of buildings
E04C2/00	Building elements of relatively thin form for the construction of parts of buildings, e.g. sheet materials, slabs, or panels
E04C2/04	Of concrete or other stone-like material; Of asbestos cement
E04C2/06	Reinforced
E04C3/00	Structural elongated elements designed for load-supporting
E04C3/02	Joists; Girders, trusses, or truss-like structures, e.g. prefabricated; Lintels; Transoms
E04D	Roof coverings; Sky-lights; Gutters; Roof-working tools
E04D1/00	Roof covering by making use of tiles, slates, shingles, or other small roofing elements
E04H	Buildings or like structures for particular purposes; Swimming or splash baths or pools; Masts; Fencing; Tents or canopies, in general
E04H12/00	Towers; Masts, poles; Chimney stacks; Water-towers; Methods of erecting such structures
E05	Locks; Keys; Window or door fittings; Safes
E05B	Locks; Accessories therefor; Handcuffs
E05B1/00	Knobs or handles for wings; Knobs, handles, or press buttons for locks or latches on wings
E05B3/00	Fastening handles to lock or latch parts
E05C	Bolts or fastening devices for wings, specially for doors or windows
E06	Doors, windows, shutters, or roller blinds, in general; Ladders
E06C	Ladders
E21	Earth or rock drilling; Mining
E21B	Earth or rock drilling; Obtaining oil, gas, water, soluble or meltable materials or a slurry of minerals from wells
E21B44/00	Automatic control systems specially adapted for drilling operations, i.e. self-operating systems which function to carry out or modify a drilling operation without intervention of a human operator, e.g. computer-controlled drilling systems; Systems specially adapted for monitoring a plurality of drilling variables or conditions
E21C	Mining or quarrying
E21D	Shafts; Tunnels; Galleries; Large underground chambers
F	Section F - Mechanical engineering; Lighting; Heating; Weapons; Blasting
F01	Machines or engines in general; Engine plants in general; Steam engines
F01B	Machines or engines, in general or of positive-displacement type, e.g. steam engines

F01C	Rotary-piston or oscillating-piston machines or engines
F01D	Non-positive-displacement machines or engines, e.g. steam turbines
F01K	Steam engine plants; Steam accumulators; Engine plants not otherwise provided for; Engines using special working fluids or cycles
F02	Combustion engines; Hot-gas or combustion-product engine plants
F02B	Internal-combustion piston engines; Combustion engines in general
F02B7/00	Engines characterised by the fuel-air charge being ignited by compression ignition of an additional fuel
F02B53/00	Internal-combustion aspects of rotary-piston or oscillating-piston engines
F02B55/00	Internal-combustion aspects of rotary pistons; Outer members for co-operation with rotary pistons
F02C	Gas-turbine plants; Air intakes for jet-propulsion plants; Controlling fuel supply in air-breathing jet-propulsion plants
F02F	Cylinders, pistons, or casings for combustion engines; Arrangements of sealings in combustion engines
F02F1/00	Cylinders; Cylinder heads
F02F3/00	Pistons
F02F7/00	Casings, e.g. crankcases
F02K	Jet-propulsion plants
F02K3/00	Plants including a gas turbine driving a compressor or a ducted fan
F02K9/00	Rocket-engine plants, i.e. plants carrying both fuel and oxidant therefor; Control thereof
F02M	Supplying combustion engines in general with combustible mixtures or constituents thereof
F02M35/00	Combustion-air cleaners, air intakes, intake silencers, or induction systems specially adapted for, or arranged on, internal-combustion engines
F02M35/10	Air intakes; Induction systems
F02M35/104	Intake manifolds
F03	Machines or engines for liquids; Wind, spring, or weight motors; Producing mechanical power or a reactive propulsive thrust, not otherwise provided for
F03D	Wind motors
F03H	Producing a reactive propulsive thrust, not otherwise provided for
F03H3/00	Use of photons to produce a reactive propulsive thrust
F04	Positive-displacement machines for liquids; Pumps for liquids or elastic fluids
F04B	Positive-displacement machines for liquids; Pumps
F04B23/00	Pumping installations or systems
F04D	Non-positive-displacement pumps

F04D13/00	Pumping installations or systems
F04D25/00	Pumping installations or systems specially adapted for elastic fluids
F04F	Pumping of fluid by direct contact of another fluid or by using inertia of fluid to be pumped; Siphons
F04F9/00	Diffusion pumps
F15	Fluid-pressure actuators; Hydraulics or pneumatics in general
F15B	Systems acting by means of fluids in general; Fluid-pressure actuators, e.g. servomotors; Details of fluid-pressure systems, not otherwise provided for
F15D	Fluid dynamics, i.e. methods or means for influencing the flow of gases or liquids
F15D1/00	Influencing the flow of fluids
F16	Engineering elements or units; General measures for producing and maintaining effective functioning of machines or installations; Thermal insulation in general
F16B	Devices for fastening or securing constructional elements or machine parts together, e.g. nails, bolts, circlips, clamps, clips or wedges; Joints or jointing
F16B2/00	Friction-grip releasable fastenings
F16B2/02	Clamps, i.e. with gripping action effected by positive means other than the inherent resistance to deformation of the material of the fastening
F16B4/00	Shrinkage connection, e.g. assembled with the parts at different temperature; Force fits; Non-releasable friction-grip fastenings
F16B11/00	Connecting constructional elements or machine parts by sticking or pressing them together, e.g. cold pressure welding
F16B15/00	Nails; Staples
F16C	Shafts; Flexible shafts; Elements of crankshaft mechanisms; Rotary bodies other than gearing elements; Bearings
F16C3/00	Shafts; Axles; Cranks; Eccentrics
F16C3/02	Shafts; Axles
F16C3/04	Crankshafts, eccentric-shafts; Cranks, eccentrics
F16C11/00	Pivots; Pivotal connections
F16C11/06	Ball-joints; Other joints having more than one degree of angular freedom, i.e. universal joints
F16C13/00	Rolls, drums, discs, or the like; Bearings or mountings therefor
F16C13/02	Bearings
F16C15/00	Construction of rotary bodies to resist centrifugal force
F16C19/00	Bearings with rolling contact, for exclusively rotary movement
F16C19/02	With bearing balls essentially of the same size in one or more circular rows

F16C19/22	With bearing rollers essentially of the same size in one or more circular rows, e.g. needle bearings
F16C32/00	Bearings not otherwise provided for
F16C32/04	Using magnetic or electric supporting means
F16D	Couplings for transmitting rotation; Clutches; Brakes
F16D3/00	Yielding couplings, i.e. with means permitting movement between the connected parts during the drive
F16D3/16	Universal joints in which flexibility is produced by means of pivots or sliding or rolling connecting parts
F16F	Springs; Shock-absorbers; Means for damping vibration
F16F1/00	Springs
F16F7/00	Vibration-dampers; Shock-absorbers
F16F15/00	Suppression of vibrations in systems; Means or arrangements for avoiding or reducing out-of-balance forces, e.g. due to motion
F16G	Belts, cables, or ropes, predominantly used for driving purposes; Chains; Fittings predominantly used therefor
F16G1/00	Driving-belts
F16G9/00	Ropes or cables specially adapted for driving, or for being driven by, pulleys or other gearing elements
F16G13/00	Chains
F16H	Gearing
F16H9/00	Gearings for conveying rotary motion with variable gear ratio, or for reversing rotary motion, by endless flexible members
F16H15/00	Gearings for conveying rotary motion with variable gear ratio, or for reversing rotary motion, by friction between rotary members
F16H15/04	Gearings providing a continuous range of gear ratios
F16H53/00	Cams or cam-followers, e.g. rollers for gearing mechanisms
F16H55/00	Elements with teeth or friction surfaces for conveying motion; Worms, pulleys or sheaves for gearing mechanisms
F16H55/17	Toothed wheels
F16H55/36	Pulleys
F16H57/00	General details of gearing
F16H57/05	Of chains
F16H59/00	Control inputs to change-speed- or reversing-gearings for conveying rotary motion
F16H59/14	Inputs being a function of torque or torque demand
F16H61/00	Control functions within change-speed- or reversing-gearings for conveying rotary motion
F16H61/14	Control of torque converter lock-up clutches
F16J	Pistons; Cylinders; Pressure vessels in general; Sealings
F16J1/00	Pistons; Trunk pistons; Plungers
F16J3/00	Diaphragms; Bellows; Bellows pistons

F16J10/00	Engine or like cylinders; Features of hollow, e.g. cylindrical, bodies in general
F16J12/00	Pressure vessels in general
F16J15/00	Sealings
F16J15/06	With solid packing compressed between sealing surfaces
F16K	Valves; Taps; Cocks; Actuating-floats; Devices for venting or aerating
F16L	Pipes; Joints or fittings for pipes; Supports for pipes, cables or protective tubing; Means for thermal insulation in general
F16L23/00	Flanged joints
F16L59/00	Thermal insulation in general
F16M	Frames, casings, or beds, of engines or other machines or apparatus, not specific to an engine, machine, or apparatus provided for elsewhere; Stands or supports
F16N	Lubricating
F16P	Safety devices in general
F16S	Constructional elements in general; Structures built-up from such elements, in general
F16S1/00	Sheets, panels, or other members of similar proportions; Constructions comprising assemblies of such members
F17	Storing or distributing gases or liquids
F17C	Vessels for containing or storing compressed, liquefied, or solidified gases; Fixed-capacity gas-holders; Filling vessels with, or discharging from vessels, compressed, liquefied, or solidified gases
F17C1/00	Pressure vessels, e.g. gas cylinder, gas tank, replaceable cartridge
F17D	Pipe-line systems; Pipe-lines
F17D1/00	Pipe-line systems
F21	Lighting
F21K	Light sources not otherwise provided for
F21K2/00	Light sources using luminescence
F21L	Lighting devices or systems thereof, being portable or specially adapted for transportation
F21S	Non-portable lighting devices or systems thereof
F21S11/00	Non-electric lighting devices or systems using daylight
F22	Steam generation
F22B	Methods of steam generation; Steam boilers
F23	Combustion apparatus; Combustion processes
F23G	Cremation furnaces; Consuming waste by combustion
F23G5/00	Incineration of waste; Incinerator constructions; Details, accessories or control therefor
F23G7/00	Incinerators or other apparatus specially adapted for consuming specific waste or low grade fuels, e.g. chemicals
F23J	Removal or treatment of combustion products or combustion residues; Flues

F23J15/00	Arrangements of devices for treating smoke or fumes
F23Q	Ignition; Extinguishing devices
F23Q3/00	Igniters using electrically-produced sparks
F23Q5/00	Make-and-break ignition, i.e. with spark generated between electrodes by breaking contact therebetween
F23Q7/00	Incandescent ignition; Igniters using electrically-produced heat, e.g. lighters for cigarettes; Electrically-heated glowing plugs
F24	Heating; Ranges; Ventilating
F24C	Other domestic stoves or ranges; Details of domestic stoves or ranges, of general application
F24C7/00	Stoves or ranges heated by electric energy
F24C7/02	Using microwaves
F24D	Domestic- or space-heating systems, e.g. central heating systems; Domestic hot-water supply systems; Elements or components therefor
F24D10/00	District heating systems
F24D13/00	Electric heating systems
F24D13/02	Solely using resistance heating, e.g. underfloor heating
F24F	Air-conditioning; Air-humidification; Ventilation; Use of air currents for screening
F24F7/00	Ventilation
F24J	Production or use of heat not otherwise provided for
F24J2/00	Use of solar heat, e.g. solar heat collectors
F24J2/06	Having concentrating elements
F25	Refrigeration or cooling; Combined heating and refrigeration systems; Heat pump systems; Manufacture or storage of ice; Liquefaction or solidification of gases
F25B	Refrigeration machines, plants, or systems; Combined heating and refrigeration systems; Heat pump systems
F25B9/00	Compression machines, plant, or systems, in which the refrigerant is air or other gas of low boiling point
F25B9/02	Using joule-thompson effect; Using vortex effect
F25B21/00	Machines, plant, or systems, using electric or magnetic effects
F25B30/00	Heat pumps
F25D	Refrigerators; Cold rooms; Ice-boxes; Cooling or freezing apparatus not covered by any other subclass
F25J	Liquefaction, solidification, or separation of gases or gaseous mixtures by pressure and cold treatment
F26	Drying
F26B	Drying solid materials or objects by removing liquid therefrom
F27	Furnaces; Kilns; Ovens; Retorts
F27B	Furnaces, kilns, ovens, or retorts in general; Open sintering

	or like apparatus
F27B3/00	Hearth-type furnaces, e.g. of reverberatory type; Electric arc furnaces
F27B3/08	Heated electrically, e.g. electric arc furnaces, with or without any other source of heat
F27D	Details or accessories of furnaces, kilns, ovens, or retorts, in so far as they are of kinds occurring in more than one kind of furnace
F27D11/00	Arrangement of elements for electric heating in or on furnaces
F27D11/08	Heating by electric discharge, e.g. arc discharge
F28	Heat exchange in general
F28B	Steam or vapour condensers
F28C	Heat-exchange apparatus, not provided for in another subclass, in which the heat-exchange media come into direct contact without chemical interaction
F28C1/00	Direct-contact trickle coolers, e.g. cooling towers
F28D	Heat-exchange apparatus, not provided for in another subclass, in which the heat-exchange media do not come into direct contact; Heat storage plants or apparatus in general
F28D15/00	Heat-exchange apparatus with the intermediate heat-transfer medium in closed tubes passing into or through the conduit walls
F28D15/02	In which the medium condenses and evaporates, e.g. heat-pipes
F28D20/00	Heat storage plants or apparatus in general; Regenerative heat-exchange apparatus not covered by groups F28D17/00 or F28D19/00
F28F	Details of heat-exchange or heat-transfer apparatus, of general application
F41	Weapons
F41A	Functional features or details common to both smallarms and ordnance, e.g. cannons; Mountings for smallarms or ordnance
F41A1/00	Missile propulsion characterised by the use of explosive or combustible propellant charges
F41B	Weapons for projecting missiles without use of explosive or combustible propellant charge; Weapons not otherwise provided for
F41B6/00	Electromagnetic launchers
F41G	Weapon sights; Aiming
F41G7/00	Direction control systems for self-propelled missiles
F41H	Armour; Armoured turrets; Armoured or armed vehicles; Means of attack or defence, e.g. camouflage, in general
F41H5/00	Armour; Armour plates
F41H7/00	Armoured or armed vehicles
F42	Ammunition; Blasting
F42B	Explosive charges, e.g. for blasting; Fireworks; Ammunition
G	Section G - Physics

G01	Measuring; Testing
G01B	Measuring length, thickness or similar linear dimensions; Measuring angles; Measuring areas; Measuring irregularities of surfaces or contours
G01B3/00	Instruments as specified in the subgroups and characterised by the use of mechanical measuring means
G01B3/16	Compasses, i.e. with a pair of pivoted arms
G01B3/18	Micrometers
G01B5/00	Measuring arrangements characterised by the use of mechanical means
G01B5/008	Using coordinate measuring machines
G01B7/00	Measuring arrangements characterised by the use of electric or magnetic means
G01B7/16	For measuring the deformation in a solid, e.g. by resistance strain gauge
G01B9/00	Instruments as specified in the subgroups and characterised by the use of optical measuring means
G01B9/02	Interferometers
G01B9/021	Using holographic techniques
G01B9/04	Measuring microscopes
G01B9/10	Goniometers for measuring angles between surfaces
G01B17/00	Measuring arrangements characterised by the use of infrasonic, sonic, or ultrasonic vibrations
G01C	Measuring distances, levels or bearings; Surveying; Navigation; Gyroscopic instruments; Photogrammetry or videogrammetry
G01C1/00	Measuring angles
G01C3/00	Measuring distances in line of sight; Optical rangefinders
G01C5/00	Measuring height; Measuring distances transverse to line of sight; Levelling between separated points; Surveyors' levels
G01C11/00	Photogrammetry or videogrammetry, e.g. stereogrammetry; Photographic surveying
G01C17/00	Compasses; Devices for ascertaining true or magnetic north for navigation or surveying purposes
G01C19/00	Gyroscopes; Turn-sensitive devices with vibrating masses; Turn-sensitive devices without moving masses
G01C19/72	With counter-rotating light beams in a passive ring, e.g. fibre laser gyrometers
G01C21/00	Navigation; Navigational instruments not provided for in groups G01C1/00 to G01C19/00
G01C25/00	Manufacturing, calibrating, cleaning, or repairing instruments or devices referred to in the other groups of this subclass
G01D	Measuring not specially adapted for a specific variable; Arrangements for measuring two or more variables not covered by a single other subclass; Tariff metering apparatus; Measuring or testing not otherwise provided for

G01D4/00	Tariff metering apparatus
G01D7/00	Indicating measured values
G01D9/00	Recording measured values
G01D18/00	Testing or calibrating of apparatus or arrangements provided for in groups G01D1/00 to G01D15/00
G01F	Measuring volume, volume flow, mass flow, or liquid level; Metering by volume
G01G	Weighing
G01H	Measurement of mechanical vibrations or ultrasonic, sonic or infrasonic waves
G01H5/00	Measuring propagation velocity of ultrasonic, sonic or infrasonic waves
G01J	Measurement of intensity, velocity, spectral content, polarisation, phase or pulse characteristics of infra-red, visible or ultra-violet light; Colorimetry; Radiation pyrometry
G01J1/00	Photometry, e.g. photographic exposure meter
G01J1/08	Arrangements of light sources specially adapted for photometry
G01J3/00	Spectrometry; Spectrophotometry; Monochromators; Measuring colours
G01J3/12	Generating the spectrum; Monochromators
G01J3/46	Measurement of colour; Colour measuring devices, e.g. colorimeters
G01J3/51	Using colour filters
G01J4/00	Measuring polarisation of light
G01J5/00	Radiation pyrometry
G01J7/00	Measuring velocity of light
G01K	Measuring temperature; Measuring quantity of heat; Thermally-sensitive elements not otherwise provided for
G01K7/00	Measuring temperature based on the use of electric or magnetic elements directly sensitive to heat
G01K7/02	Using thermo-electric elements, e.g. thermo-couples
G01K7/16	Using resistive elements
G01K17/00	Measuring quantity of heat
G01L	Measuring force, stress, torque, work, mechanical power, mechanical efficiency, or fluid pressure
G01L1/00	Measuring force or stress, in general
G01L3/00	Measuring torque, work, mechanical power, or mechanical efficiency, in general
G01N	Investigating or analysing materials by determining their chemical or physical properties
G01N3/00	Investigating strength properties of solid materials by application of mechanical stress
G01N3/08	By applying steady tensile or compressive forces
G01N3/30	By applying a single impulsive force

G01N3/32	By applying repeated or pulsating forces
G01N3/40	Investigating hardness or rebound hardness
G01N3/56	Investigating resistance to wear or abrasion
G01N9/00	Investigating density or specific gravity of materials; Analysing materials by determining density or specific gravity
G01N17/00	Investigating resistance of materials to the weather, to corrosion, or to light
G01N21/00	Investigating or analysing materials by the use of optical means, i.e. using infra-red, visible, or ultra-violet light
G01N21/88	Investigating the presence of flaws, defects or contamination
G01N24/00	Investigating or analysing materials by the use of nuclear magnetic resonance, electron paramagnetic resonance or other spin effects
G01N27/00	Investigating or analysing materials by the use of electric, electro-chemical, or magnetic means
G01N27/90	Using eddy currents
G01N29/00	Investigating or analysing materials by the use of ultrasonic, sonic or infrasonic waves; Visualisation of the interior of objects by transmitting ultrasonic or sonic waves through the object
G01N29/14	Using acoustic emission techniques
G01P	Measuring linear or angular speed, acceleration, deceleration, or shock; Indicating presence, absence, or direction, of movement
G01P1/00	Details of instruments
G01P3/00	Measuring linear or angular speed; Measuring differences of linear or angular speeds
G01P3/36	Devices characterised by the use of optical means, e.g. using infra-red, visible, or ultra-violet light
G01P5/00	Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to fluids, e.g. of ship, of aircraft
G01P5/02	By measuring forces exerted by the fluid on solid bodies, e.g. anemometer
G01P15/00	Measuring acceleration; Measuring deceleration; Measuring shock, i.e. sudden change of acceleration
G01R	Measuring electric variables; Measuring magnetic variables
G01R3/00	Apparatus or processes specially adapted for the manufacture of measuring instruments
G01R5/00	Instruments for converting a single current or a single voltage into a mechanical displacement
G01R11/00	Electromechanical arrangements for measuring time integral of electric power or current, e.g. of consumption
G01R13/00	Arrangements for displaying electric variables or waveforms
G01R13/20	Cathode-ray oscilloscopes
G01R17/00	Measuring arrangements involving comparison with a

	reference value, e.g. bridge
G01R19/00	Arrangements for measuring currents or voltages or for indicating presence or sign thereof
G01R19/25	Using digital measurement techniques
G01R21/00	Arrangements for measuring electric power or power factor
G01R22/00	Arrangements for measuring time integral of electric power or current, e.g. electricity meters
G01R23/00	Arrangements for measuring frequencies; Arrangements for analysing frequency spectra
G01R23/16	Spectrum analysis; Fourier analysis
G01R27/00	Arrangements for measuring resistance, reactance, impedance, or electric characteristics derived therefrom
G01R27/26	Measuring inductance or capacitance; Measuring quality factor, e.g. by using the resonance method; Measuring loss factor; Measuring dielectric constants
G01R29/00	Arrangements for measuring or indicating electric quantities not covered by groups g01r0019000000 to g01r0027000000
G01R29/10	Radiation diagrams of aerials
G01R29/24	Arrangements for measuring quantities of charge
G01R31/00	Arrangements for testing electric properties; Arrangements for locating electric faults; Arrangements for electrical testing characterised by what is being tested not provided for elsewhere
G01R31/02	Testing of electric apparatus, lines, or components for short-circuits, discontinuities, leakage, or incorrect line connection
G01R31/08	Locating faults in cables, transmission lines, or networks
G01R31/12	Testing dielectric strength or breakdown voltage
G01R31/24	Testing of discharge tubes
G01R31/26	Testing of individual semiconductor devices
G01R31/28	Testing of electronic circuits, e.g. by signal tracer
G01R31/327	Testing of circuit interrupters, switches or circuit-breakers
G01R31/34	Testing dynamo-electric machines
G01R31/36	Apparatus for testing electrical condition of accumulators or electric batteries, e.g. capacity or charge condition
G01R33/00	Arrangements or instruments for measuring magnetic variables
G01R33/035	Using superconductive devices
G01R33/04	Using the flux-gate principle
G01S	Radio direction-finding; Radio navigation; Determining distance or velocity by use of radio waves; Locating or presence-detecting by use of the reflection or reradiation of radio waves; Analogous arrangements using other waves
G01S5/00	Position-fixing by co-ordinating two or more direction or position-line determinations; Position-fixing by co-ordinating two or more distance determinations
G01S5/02	Using radio waves

G01S13/00	Systems using the reflection or reradiation of radio waves, e.g. radar systems; Analogous systems using reflection or reradiation of waves whose nature or wavelength is irrelevant or unspecified
G01S15/00	Systems using the reflection or reradiation of acoustic waves, e.g. sonar systems
G01S17/00	Systems using the reflection or reradiation of electromagnetic waves other than radio waves, e.g. lidar systems
G01T	Measurement of nuclear or x-radiation
G01T1/00	Measuring x-radiation, gamma radiation, corpuscular radiation, or cosmic radiation
G01T1/02	Dosimeters
G01T3/00	Measuring neutron radiation
G01V	Geophysics; Gravitational measurements; Detecting masses or objects; Tags
G01V1/00	Seismology; Seismic or acoustic prospecting or detecting
G01V1/02	Generating seismic energy
G01V1/16	Receiving elements for seismic signals; Arrangements or adaptations of receiving elements
G01V1/40	Specially adapted for well-logging
G01V3/00	Electric or magnetic prospecting or detecting; Measuring magnetic field characteristics of the earth, e.g. declination or deviation
G01V3/18	Specially adapted for well-logging
G01V7/00	Measuring gravitational fields or waves; Gravimetric prospecting or detecting
G01W	Meteorology
G01W1/00	Meteorology
G01W1/10	Devices for predicting weather conditions
G02	Optics
G02B	Optical elements, systems, or apparatus
G02B3/00	Simple or compound lenses
G02B5/00	Optical elements other than lenses
G02B5/04	Prisms
G02B5/08	Mirrors
G02B5/18	Diffraction gratings
G02B5/20	Filters
G02B5/28	Interference filters
G02B5/30	Polarising elements
G02B5/32	Holograms used as optical elements
G02B6/00	Light guides; Structural details of arrangements comprising light guides and other optical elements, e.g. couplings
G02B6/02	Optical fibre with cladding

G02B6/10	Of the optical waveguide type
G02B6/12	Of the integrated circuit kind
G02B6/24	Coupling light guides
G02B6/42	Coupling light guides with opto-electronic elements
G02B21/00	Microscopes
G02B23/00	Telescopes, e.g. binoculars; Periscopes; Instruments for viewing the inside of hollow bodies; Viewfinders; Optical aiming or sighting devices
G02B27/00	Other optical systems; Other optical apparatus
G02B27/01	Head-up displays
G02B27/10	Beam splitting or combining systems
G02B27/18	For optical projection, e.g. combination of mirror and condenser and objective
G02B27/28	For polarising
G02B27/30	Collimators
G02B27/40	Optical focusing aids
G02B27/42	Diffraction optics
G02B27/60	Systems using moire fringes
G02F	Devices or arrangements, the optical operation of which is modified by changing the optical properties of the medium of the devices or arrangements for the control of the intensity, colour, phase, polarisation or direction of light, e.g. switching, gating, modulating or demodulating; Techniques or procedures for the operation thereof; Frequency-changing; Non-linear optics; Optical logic elements; Optical analogue/digital converters
G02F1/00	Devices or arrangements for the control of the intensity, colour, phase, polarisation or direction of light arriving from an independent light source, e.g. switching, gating or modulating; Non-linear optics
G02F1/13	Based on liquid crystals, e.g. single liquid crystal display cells
G02F1/29	For the control of the position or the direction of light beams, i.e. deflection
G02F1/35	Non-linear optics
G02F2/00	Demodulating light; Transferring the modulation of modulated light; Frequency-changing of light
G02F3/00	Optical logic elements; Optical bistable devices
G03	Photography; Cinematography; Analogous techniques using waves other than optical waves; Electrography; Holography
G03B	Apparatus or arrangements for taking photographs or for projecting or viewing them; Apparatus or arrangements employing analogous techniques using waves other than optical waves; Accessories therefor
G03B3/00	Focusing arrangements of general interest for cameras, projectors or printers
G03B7/00	Control of exposure by setting shutters, diaphragms, or filters separately or conjointly

G03B9/00	Exposure-making shutters; Diaphragms
G03B11/00	Filters or other obturators specially adapted for photographic purposes
G03B17/00	Details of cameras or camera bodies; Accessories therefor
G03B19/00	Cameras
G03B21/00	Projectors or projection-type viewers; Accessories therefor
G03B31/00	Associated working of cameras or projectors with sound-recording or -reproducing means
G03B39/00	High-speed photography
G03C	Photosensitive materials for photographic purposes; Photographic processes, e.g. cine, x-ray, colour, stereo-photographic processes; Auxiliary processes in photography
G03C1/00	Photosensitive materials
G03C1/08	Sensitivity-increasing substances
G03C5/00	Photographic processes or agents therefor; Regeneration of such processing agents
G03C5/02	Sensitometric processes, e.g. determining sensitivity, colour sensitivity, gradation, graininess, density; Making sensitometric wedges
G03F	Photomechanical production of textured or patterned surfaces, e.g. for printing, for processing of semiconductor devices; Materials therefor; Originals therefor; Apparatus specially adapted therefor
G03F7/00	Photomechanical, e.g. photolithographic, production of textured or patterned surfaces, e.g. printed surfaces; Materials therefor, e.g. comprising photoresists; Apparatus specially adapted therefor
G03F7/20	Exposure; Apparatus therefor
G03G	Electrography; Electrophotography; Magnetography
G03G15/00	Apparatus for electrographic processes using a charge pattern
G03H	Holographic processes or apparatus
G03H3/00	Holographic processes or apparatus using ultrasonic, sonic, or infrasonic waves for obtaining holograms; Processes or apparatus for obtaining an optical image from them
G05	Controlling; Regulating
G05B	Control or regulating systems in general; Functional elements of such systems; Monitoring or testing arrangements for such systems or elements
G05B13/00	Adaptive control systems, i.e. systems automatically adjusting themselves to have a performance which is optimum according to some preassigned criterion
G05B15/00	Systems controlled by a computer
G05B17/00	Systems involving the use of models or simulators of said systems
G05B19/00	Programme-control systems
G05B19/05	Programmable logic controllers, e.g. simulating logic interconnections of signals according to ladder diagrams or

	function charts
G05B19/18	Numerical control (nc), i.e. automatically operating machines, in particular machine tools, e.g. in a manufacturing environment, so as to execute positioning, movement or co-ordinated operations by means of programme data in numerical form
G05B19/4097	Characterised by using design data to control nc machines, e.g. cad/cam
G05B19/418	Total factory control, i.e. centrally controlling a plurality of machines, e.g. direct or distributed numerical control (dnc), flexible manufacturing systems (fms), integrated manufacturing systems (ims), computer integrated manufacturing (cim)
G05D	Systems for controlling or regulating non-electric variables
G05D1/00	Control of position, course, altitude, or attitude of land, water, air, or space vehicles, e.g. automatic pilot
G05D1/08	Control of attitude, i.e. control of roll, pitch, or yaw
G05D3/00	Control of position or direction
G05D7/00	Control of flow
G05D9/00	Level control, e.g. controlling quantity of material stored in vessel
G05D13/00	Control of linear speed; Control of angular speed; Control of acceleration or deceleration, e.g. of a prime mover
G05D15/00	Control of mechanical force or stress; Control of mechanical pressure
G05D17/00	Control of torque; Control of mechanical power
G05D19/00	Control of mechanical oscillations, e.g. of amplitude, of frequency, of phase
G05D21/00	Control of chemical or physico-chemical variables, e.g. ph-value
G05D22/00	Control of humidity
G05D23/00	Control of temperature
G05F	Systems for regulating electric or magnetic variables
G05F7/00	Regulating magnetic variables
G05G	Control devices or systems insofar as characterised by mechanical features only
G06	Computing; Calculating; Counting
G06E	Optical computing devices
G06F	Electric digital data processing
G06F1/00	Details not covered by groups g06f0003000000 to g06f0013000000 and g06f0021000000
G06F1/02	Digital function generators
G06F1/04	Generating or distributing clock signals or signals derived directly therefrom
G06F1/26	Power supply means, e.g. regulation thereof
G06F1/32	Means for saving power

G06F3/00	Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit, e.g. interface arrangements
G06F3/02	Input arrangements using manually operated switches, e.g. using keyboards or dials
G06F3/033	Pointing devices displaced or positioned by the user, e.g. mice, trackballs, pens or joysticks; Accessories therefor
G06F3/048	Interaction techniques for graphical user interfaces, e.g. interaction with windows, icons or menus
G06F3/06	Digital input from, or digital output to, record carriers
G06F3/12	Digital output to print unit
G06F3/13	Digital output to plotter
G06F3/14	Digital output to display device
G06F7/00	Methods or arrangements for processing data by operating upon the order or content of the data handled
G06F9/00	Arrangements for programme control, e.g. control unit
G06F9/22	Micro-control or micro-programme arrangements
G06F9/44	Arrangements for executing specific programmes
G06F9/445	Programme loading or initiating
G06F9/45	Compilation or interpretation of high level programme languages
G06F9/455	Emulation; Software simulation
G06F9/46	Multiprogramming arrangements
G06F11/00	Error detection; Error correction; Monitoring
G06F11/25	Testing of logic operation, e.g. by logic analysers
G06F11/34	Recording or statistical evaluation of computer activity, e.g. of down time, of input/output operation
G06F11/36	Preventing errors by testing or debugging of software
G06F12/00	Accessing, addressing or allocating within memory systems or architectures
G06F12/02	Addressing or allocation; Relocation
G06F12/08	In hierarchically structured memory systems, e.g. virtual memory systems
G06F13/00	Interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units
G06F15/00	Digital computers in general; Data processing equipment in general
G06F15/16	Combinations of two or more digital computers each having at least an arithmetic unit, a programme unit and a register, e.g. for a simultaneous processing of several programmes
G06F15/18	In which a programme is changed according to experience gained by the computer itself during a complete run; Learning machines
G06F15/76	Architectures of general purpose stored programme

	computers
G06F17/00	Digital computing or data processing equipment or methods, specially adapted for specific functions
G06F17/10	Complex mathematical operations
G06F17/20	Handling natural language data
G06F17/21	Text processing
G06F17/30	Information retrieval; Database structures therefor
G06F17/40	Data acquisition and logging
G06F17/50	Computer-aided design
G06F19/00	Digital computing or data processing equipment or methods, specially adapted for specific applications
G06F21/00	Security arrangements for protecting computers or computer systems against unauthorised activity
G06G	Analogue computers
G06J	Hybrid computing arrangements
G06K	Recognition of data; Presentation of data; Record carriers; Handling record carriers
G06K1/00	Methods or arrangements for marking the record carrier in digital fashion
G06K7/00	Methods or arrangements for sensing record carriers
G06K7/10	By electromagnetic radiation, e.g. optical sensing; By corpuscular radiation
G06K9/00	Methods or arrangements for reading or recognising printed or written characters or for recognising patterns, e.g. fingerprints
G06K15/00	Arrangements for producing a permanent visual presentation of the output data
G06K19/00	Record carriers for use with machines and with at least a part designed to carry digital markings
G06K19/067	Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards
G06K19/07	With integrated circuit chips
G06K21/00	Information retrieval from punched cards designed for manual use or handling by machine; Apparatus for handling such cards, e.g. marking or correcting
G06N	Computer systems based on specific computational models
G06N3/00	Computer systems based on biological models
G06N5/00	Computer systems utilizing knowledge based models
G06Q	Data processing systems or methods, specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes; Systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes, not otherwise provided for
G06Q10/00	Administration, e.g. office automation or reservations; Management, e.g. resource or project management
G06Q20/00	Payment schemes, architectures or protocols

G06Q30/00	Commerce, e.g. marketing, shopping, billing, auctions or e-commerce
G06Q40/00	Finance, e.g. banking, investment or tax processing; Insurance, e.g. risk analysis or pensions
G06Q50/00	Systems or methods specially adapted for a specific business sector, e.g. health care, utilities, tourism or legal services
G06T	Image data processing or generation, in general
G06T5/00	Image enhancement or restoration, e.g. from bit-mapped to bit-mapped creating a similar image
G06T7/00	Image analysis, e.g. from bit-mapped to non bit-mapped
G06T7/20	Analysis of motion
G06T7/40	Analysis of texture
G06T9/00	Image coding, e.g. from bit-mapped to non bit-mapped
G06T13/00	Animation effects in two dimensional (2d) images, e.g. using sprites
G06T15/00	Three dimensional (3d) image rendering, e.g. from a model to a bit-mapped image
G06T15/70	Animation effects
G07	Checking-devices
G07F	Coin-freed or like apparatus
G07F11/00	Coin-freed apparatus for dispensing, or the like, discrete articles
G07F19/00	Complete banking systems; Coded card-freed arrangements adapted for dispensing or receiving monies or the like and posting such transactions to existing accounts, e.g. automatic teller machines
G08	Signalling
G08B	Signalling or calling systems; Order telegraphs; Alarm systems
G08B17/00	Fire alarms; Alarms responsive to explosion
G08B17/10	Actuation by presence of smoke or gases
G08G	Traffic control systems
G08G1/00	Traffic control systems for road vehicles
G08G1/09	Arrangements for giving variable traffic instructions
G08G1/16	Anti-collision systems
G08G5/00	Traffic control systems for aircraft
G08G99/00	Subject matter not provided for in other groups of this subclass
G09	Educating; Cryptography; Display; Advertising; Seals
G09B	Educational or demonstration appliances; Appliances for teaching, or communicating with, the blind, deaf or mute; Models; Planetaria; Globes; Maps; Diagrams
G09B5/00	Electrically-operated educational appliances
G10	Musical instruments; Acoustics
G10H	Electrophonic musical instruments

G10K	Sound-producing devices; Acoustics not otherwise provided for
G10K1/00	Devices in which sound is produced by striking a resonating body, e.g. bell, chimes, gong
G10K11/00	Methods or devices for transmitting, conducting or directing sound in general; Methods or devices for protecting against, or for damping, noise or other acoustic waves in general
G10L	Speech analysis or synthesis; Speech recognition
G10L13/00	Speech synthesis; Text to speech systems
G10L15/00	Speech recognition
G10L17/00	Speaker identification or verification
G10L19/00	Speech analysis-synthesis techniques for redundancy reduction, e.g. in vocoders; Coding or decoding of speech
G10L21/00	Processing of the speech signal to produce another audible or non-audible signal, e.g. visual, tactile, in order to modify its quality or its intelligibility
G11	Information storage
G11B	Information storage based on relative movement between record carrier and transducer
G11B5/00	Recording by magnetisation or demagnetisation of a record carrier; Reproducing by magnetic means; Record carriers therefor
G11B5/008	Recording on, or reproducing or erasing from, magnetic tapes or wires
G11B5/012	Recording on, or reproducing or erasing from, magnetic discs
G11B5/09	Digital recording
G11B5/127	Structure or manufacture of heads, e.g. inductive
G11B5/84	Processes or apparatus specially adapted for manufacturing record carriers
G11B7/00	Recording or reproducing by optical means, e.g. recording using a thermal beam of optical radiation, reproducing using an optical beam at lower power; Record carriers therefor
G11B11/00	Recording on, or reproducing from, the same record carrier wherein for these two operations the methods or means are covered by different main groups of groups G11B3/00 to G11B7/00 or by different subgroups of group G11B9/00; Record carriers therefor
G11C	Static stores
G11C11/00	Digital stores characterised by the use of particular electric or magnetic storage elements; Storage elements therefor
G11C11/02	Using magnetic elements
G11C11/22	Using ferroelectric elements
G11C11/34	Using semiconductor devices
G11C13/00	Digital stores characterised by the use of storage elements not covered by groups G11C11/00, G11C23/00, or G11C25/00
G11C13/04	Using optical elements

G11C15/00	Digital stores in which information comprising one or more characteristic parts is written into the store and in which information is read-out by searching for one or more of these characteristic parts, i.e. associative or content-addressed stores
G11C16/00	Erasable programmable read-only memories
G11C16/02	Electrically programmable
G11C17/00	Read-only memories programmable only once; Semi-permanent stores, e.g. manually-replaceable information cards
G11C17/14	In which contents are determined by selectively establishing, breaking or modifying connecting links by permanently altering the state of coupling elements, e.g. prom
G11C27/00	Electric analogue stores, e.g. for storing instantaneous values
G12	Instrument details
G12B	Details of instruments, or comparable details of other apparatus, not otherwise provided for
G12B13/00	Calibrating of instruments or apparatus
G21	Nuclear physics; Nuclear engineering
G21B	Fusion reactors
G21B1/00	Thermonuclear fusion reactors
G21B1/01	Hybrid fission-fusion nuclear reactors
G21B1/25	Maintenance, e.g. repair or remote inspection
G21C	Nuclear reactors
G21C1/00	Reactors
G21C3/00	Reactor fuel elements or their assemblies; Selection of substances for use as reactor fuel elements
G21C5/00	Moderator or core structure; Selection of materials for use as moderator
G21C7/00	Control of nuclear reaction
G21C9/00	Emergency protection arrangements structurally associated with the reactor
G21C11/00	Shielding structurally associated with the reactor
G21C15/00	Cooling arrangements within the pressure vessel containing the core; Selection of specific coolants
G21C17/00	Monitoring; Testing
G21D	Nuclear power plant
G21D3/00	Control of nuclear power plant
G21D3/08	Regulation of any parameters in the plant
G21F	Protection against x-radiation, gamma radiation, corpuscular radiation or particle bombardment; Treating radioactively contaminated material; Decontamination arrangements therefor
G21F5/00	Transportable or portable shielded containers

G21F9/00	Treating radioactively contaminated material; Decontamination arrangements therefor
G21G	Conversion of chemical elements; Radioactive sources
G21G4/00	Radioactive sources
G21H	Obtaining energy from radioactive sources; Applications of radiation from radioactive sources; Utilising cosmic radiation
G21H1/00	Arrangements for obtaining electrical energy from radioactive sources, e.g. from radioactive isotopes
G21H3/00	Arrangements for direct conversion of radiation energy from radioactive sources into forms of energy other than electric energy, e.g. light
G21J	Nuclear explosives; Applications thereof
G21K	Techniques for handling particles or electromagnetic radiation not otherwise provided for; Irradiation devices; Gamma- or x-ray microscopes
G21K7/00	Gamma- or x-ray microscopes
H	Section H - Electricity
H01	Basic electric elements
H01B	Cables; Conductors; Insulators; Selection of materials for their conductive, insulating, or dielectric properties
H01B1/00	Conductors or conductive bodies characterised by the conductive materials; Selection of materials as conductors
H01B3/00	Insulators or insulating bodies characterised by the insulating materials; Selection of materials for their insulating or dielectric properties
H01B3/02	Mainly consisting of inorganic substances
H01B3/18	Mainly consisting of organic substances
H01B5/00	Non-insulated conductors or conductive bodies characterised by their form
H01B7/00	Insulated conductors or cables characterised by their form
H01B7/14	Submarine cables
H01B7/17	Protection against damage caused by external factors, e.g. sheaths or armouring
H01B7/32	With arrangements for indicating defects, e.g. breaks, leaks
H01B9/00	Power cables
H01B11/00	Communication cables or conductors
H01B11/02	Cables with twisted pairs or quads
H01B11/18	Coaxial cables; Analogous cables having more than one inner conductor within a common outer conductor
H01B12/00	Superconductive or hyperconductive conductors, cables, or transmission lines
H01B17/00	Insulators or insulating bodies characterised by their form
H01C	Resistors
H01C7/00	Non-adjustable resistors formed as one or more layers or coatings; Non-adjustable resistors made from powdered

	conducting material or powdered semi-conducting material with or without insulating material
H01C7/10	Voltage responsive, i.e. varistors
H01C10/00	Adjustable resistors
H01F	Magnets; Inductances; Transformers; Selection of materials for their magnetic properties
H01F1/00	Magnets or magnetic bodies characterised by the magnetic materials therefor; Selection of materials for their magnetic properties
H01F1/12	Of soft-magnetic materials
H01F1/40	Of magnetic semiconductor materials, e.g. cdcr2s4
H01F1/44	Of magnetic liquids, e.g. ferrofluids
H01F3/00	Cores, yokes, or armatures
H01F5/00	Coils
H01F6/00	Superconducting magnets; Superconducting coils
H01F6/06	Coils, e.g. winding, insulating, terminating or casing arrangements therefor
H01F7/00	Magnets
H01F7/02	Permanent magnets
H01F7/06	Electromagnets; Actuators including electromagnets
H01F10/00	Thin magnetic films, e.g. of one-domain structure
H01F10/08	Characterised by magnetic layers
H01F13/00	Apparatus or processes for magnetising or demagnetising
H01F27/00	Details of transformers or inductances, in general
H01F27/24	Magnetic cores
H01F27/28	Coils; Windings; Conductive connections
H01F36/00	Transformers with superconductive windings or with windings operating at cryogenic temperatures
H01F38/00	Adaptations of transformers or inductances for specific applications or functions
H01F38/14	Inductive couplings
H01F38/20	Instrument transformers
H01F38/28	Current transformers
H01G	Capacitors; Capacitors, rectifiers, detectors, switching devices, light-sensitive or temperature-sensitive devices of the electrolytic type
H01G4/00	Fixed capacitors; Processes of their manufacture
H01G4/12	Ceramic dielectrics
H01G4/33	Thin- or thick-film capacitors
H01G9/00	Electrolytic capacitors, rectifiers, detectors, switching devices, light-sensitive or temperature-sensitive devices; Processes of their manufacture
H01H	Electric switches; Relays; Selectors; Emergency protective devices

H01H7/00	Devices for introducing a predetermined time delay between the initiation of the switching operation and the opening or closing of the contacts
H01H9/00	Details of switching devices, not covered by groups h01h0001000000 to h01h0007000000
H01H9/30	Means for extinguishing or preventing arc between current-carrying parts
H01H33/00	High-tension or heavy-current switches with arc-extinguishing or arc-preventing means
H01H33/66	Vacuum switches
H01H43/00	Time or time-programme switches providing a choice of time-intervals for executing one or more switching actions and automatically terminating their operation after the programme is completed
H01H45/00	Details of relays
H01H50/00	Details of electromagnetic relays
H01H59/00	Electrostatic relays; Electro-adhesion relays
H01H71/00	Details of the protective switches or relays covered by groups H01H73/00 to H01H83/00
H01J	Electric discharge tubes or discharge lamps
H01J1/00	Details of electrodes, of magnetic control means, of screens, or of the mounting or spacing thereof, common to two or more basic types of discharge tubes or lamps
H01J1/13	Solid thermionic cathodes
H01J13/00	Discharge tubes with liquid-pool cathodes, e.g. metal-vapour rectifying tubes
H01J17/00	Gas-filled discharge tubes with solid cathode
H01J17/38	Cold-cathode tubes
H01J17/49	Display panels, e.g. with crossed electrodes
H01J17/50	Thermionic-cathode tubes
H01J21/00	Vacuum tubes
H01J23/00	Details of transit-time tubes of the types covered by group H01J25/00
H01J25/00	Transit-time tubes, e.g. klystrons, travelling-wave tubes, magnetrons
H01J27/00	Ion beam tubes
H01J29/00	Details of cathode-ray tubes or of electron-beam tubes of the types covered by group H01J31/00
H01J29/18	Luminescent screens
H01J29/48	Electron guns
H01J31/00	Cathode-ray tubes; Electron-beam tubes
H01J35/00	X-ray tubes
H01J37/00	Discharge tubes with provision for introducing objects or material to be exposed to the discharge, e.g. for the purpose of examination or processing thereof

H01J37/06	Electron sources; Electron guns
H01J37/26	Electron or ion microscopes; Electron- or ion-diffraction tubes
H01J37/31	For cutting or drilling
H01J37/315	For welding
H01J37/317	For changing properties of the objects or for applying thin layers thereon, e.g. ion implantation
H01J43/00	Secondary-emission tubes; Electron-multiplier tubes
H01J45/00	Discharge tubes functioning as thermionic generators
H01J47/00	Tubes for determining the presence, intensity, density or energy of radiation or particles
H01J49/00	Particle spectrometers or separator tubes
H01J61/00	Gas- or vapour-discharge lamps
H01K	Electric incandescent lamps
H01L	Semiconductor devices; Electric solid state devices not otherwise provided for
H01L21/00	Processes or apparatus specially adapted for the manufacture or treatment of semiconductor or solid state devices or of parts thereof
H01L21/02	Manufacture or treatment of semiconductor devices or of parts thereof
H01L21/70	Manufacture or treatment of devices consisting of a plurality of solid state components or integrated circuits formed in or on a common substrate or of specific parts thereof; Manufacture of integrated circuit devices or of specific parts thereof
H01L23/00	Details of semiconductor or other solid state devices
H01L23/02	Containers; Seals
H01L23/34	Arrangements for cooling, heating, ventilating or temperature compensation
H01L23/48	Arrangements for conducting electric current to or from the solid state body in operation, e.g. leads or terminal arrangements
H01L27/00	Devices consisting of a plurality of semiconductor or other solid-state components formed in or on a common substrate
H01L27/082	Including bipolar components only
H01L27/085	Including field-effect components only
H01L27/10	Including a plurality of individual components in a repetitive configuration
H01L27/102	Including bipolar components
H01L27/105	Including field-effect components
H01L27/108	Dynamic random access memory structures
H01L27/11	Static random access memory structures
H01L27/112	Read-only memory structures
H01L27/115	Electrically programmable read-only memories
H01L27/12	The substrate being other than a semiconductor body, e.g.

	an insulating body
H01L27/14	Including semiconductor components sensitive to infra-red radiation, light, electromagnetic radiation of shorter wavelength or corpuscular radiation and specially adapted either for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation
H01L27/142	Energy conversion devices
H01L27/146	Imager structures
H01L27/148	Charge coupled imagers
H01L27/15	Including semiconductor components with at least one potential-jump barrier or surface barrier, specially adapted for light emission
H01L27/16	Including thermoelectric components with or without a junction of dissimilar materials; Including thermomagnetic components
H01L27/18	Including components exhibiting superconductivity
H01L27/20	Including piezo-electric components; Including electrostrictive components; Including magnetostrictive components
H01L27/22	Including components using galvano-magnetic effects, e.g. hall effect; Using similar magnetic field effects
H01L27/24	Including solid state components for rectifying, amplifying, or switching without a potential-jump barrier or surface barrier
H01L27/26	Including bulk negative resistance effect components
H01L27/28	Including components using organic materials as the active part, or using a combination of organic materials with other materials as the active part
H01L29/00	Semiconductor devices specially adapted for rectifying, amplifying, oscillating or switching and having at least one potential-jump barrier or surface barrier; Capacitors or resistors with at least one potential-jump barrier or surface barrier, e.g. pn-junction depletion layer or carrier concentration layer; Details of semiconductor bodies or of electrodes thereof
H01L31/00	Semiconductor devices sensitive to infra-red radiation, light, electromagnetic radiation of shorter wavelength, or corpuscular radiation and specially adapted either for the conversion of the energy of such radiation into electrical energy or for the control of electrical energy by such radiation; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof
H01L31/024	Arrangements for cooling, heating, ventilating or temperature compensation
H01L31/04	Adapted as conversion devices
H01L31/042	Including a panel or array of photoelectric cells, e.g. solar cells

H01L31/101	Devices sensitive to infra-red, visible or ultra-violet radiation
H01L31/115	Devices sensitive to very short wavelength, e.g. x-rays, gamma-rays or corpuscular radiation
H01L33/00	Semiconductor devices with at least one potential-jump barrier or surface barrier specially adapted for light emission, e.g. infra-red; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof
H01L35/00	Thermoelectric devices comprising a junction of dissimilar materials, i.e. exhibiting seebeck or peltier effect with or without other thermoelectric effects or thermomagnetic effects; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof
H01L37/00	Thermoelectric devices without a junction of dissimilar materials; Thermomagnetic devices, e.g. using nernst-ettinghausen effect; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof
H01L39/00	Devices using superconductivity or hyperconductivity; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof
H01L39/24	Processes or apparatus specially adapted for the manufacture or treatment of devices provided for in group H01L39/00 or of parts thereof
H01L41/00	Piezo-electric elements in general; Electrostrictive elements in general; Magnetostrictive elements in general; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof; Details thereof
H01L41/18	For piezo-electric or electrostrictive elements
H01L43/00	Devices using galvano-magnetic or similar magnetic effects; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof
H01L43/06	Hall-effect devices
H01L43/08	Magnetic-field-controlled resistors
H01L45/00	Solid state devices specially adapted for rectifying, amplifying, oscillating, or switching without a potential-jump barrier or surface barrier, e.g. dielectric triodes; Ovshinsky-effect devices; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof
H01L47/00	Bulk negative resistance effect devices, e.g. gunn-effect devices; Processes or apparatus specially adapted for the manufacture or treatment thereof or of parts thereof
H01L51/00	Solid state devices using organic materials as the active part, or using a combination of organic materials with other materials as the active part; Processes or apparatus specially adapted for the manufacture or treatment of such devices, or of parts thereof
H01L51/05	Specially adapted for rectifying, amplifying, oscillating or switching and having at least one potential-jump barrier or surface barrier; Capacitors or resistors with at least one potential-jump barrier or surface barrier

H01L51/50	Specially adapted for light emission, e.g. organic light emitting diodes (oled) or polymer light emitting devices (pled)
H01M	Processes or means, e.g. batteries, for the direct conversion of chemical energy into electrical energy
H01M4/00	Electrodes
H01M6/00	Primary cells; Manufacture thereof
H01M8/00	Fuel cells; Manufacture thereof
H01M8/08	Fuel cells with aqueous electrolytes
H01M8/10	Fuel cells with solid electrolytes
H01M8/12	Operating at high temperature, e.g. with stabilised zro2 electrolyte
H01M8/14	Fuel cells with fused electrolytes
H01M10/00	Secondary cells; Manufacture thereof
H01M10/06	Lead-acid accumulators
H01P	Waveguides; Resonators, lines or other devices of the waveguide type
H01P1/00	Auxiliary devices
H01P1/20	Frequency-selective devices, e.g. filters
H01P1/22	Attenuating devices
H01P3/00	Waveguides; Transmission lines of the waveguide type
H01P3/08	Microstrips; Strip lines
H01P5/00	Coupling devices of the waveguide type
H01P7/00	Resonators of the waveguide type
H01P7/08	Strip line resonators
H01P7/10	Dielectric resonators
H01Q	Aerials
H01Q1/00	Details of, or arrangements associated with, aerials
H01Q1/42	Housings not intimately mechanically associated with radiating elements, e.g. radome
H01Q1/50	Structural association of aerials with earthing switches, lead-in devices, or lightning protectors
H01Q5/00	Arrangements for simultaneous operation of aerials on two or more different wavebands
H01Q7/00	Loop aerials with a substantially uniform current distribution around the loop and having a directional radiation pattern in a plane perpendicular to the plane of the loop
H01Q13/00	Waveguide horns or mouths; Slot aerials; Leaky-waveguide aerials; Equivalent structures causing radiation along the transmission path of a guided wave
H01Q13/10	Resonant slot aerials
H01Q13/20	Non-resonant leaky-waveguide or transmission-line aerials; Equivalent structures causing radiation along the transmission path of a guided wave
H01Q21/00	Aerial arrays or systems

H01Q23/00	Aerials with active circuits or circuit elements integrated within them or attached to them
H01R	Electrically-conductive connections; Structural associations of a plurality of mutually-insulated electrical connecting elements; Coupling devices; Current collectors
H01R12/00	Structural associations of a plurality of mutually-insulated electrical connecting elements, specially adapted for printed circuits, e.g. printed circuit boards (pcbs), flat or ribbon cables, or like generally planar structures, e.g. terminal strips, terminal blocks; Coupling devices specially adapted for printed circuits, flat or ribbon cables, or like generally planar structures; Terminals specially adapted for contact with, or insertion into, printed circuits, flat or ribbon cables, or like generally planar structures
H01S	Devices using stimulated emission
H01S1/00	Masers, i.e. devices for generation, amplification, modulation, demodulation, or frequency-changing, using stimulated emission, of electromagnetic waves of wavelength longer than that of infra-red waves
H01S3/00	Lasers, i.e. devices for generation, amplification, modulation, demodulation, or frequency-changing, using stimulated emission, of infra-red, visible, or ultra-violet waves
H01S3/03	Of gas laser discharge tubes
H01S3/091	Using optical pumping
H01S3/0955	Using pumping by high energy particles
H01S3/098	Mode locking; Mode suppression
H01S3/10	Controlling the intensity, frequency, phase, polarisation or direction of the emitted radiation, e.g. switching, gating, modulating or demodulating
H01S3/105	By controlling the mutual position or the reflecting properties of the reflectors of the cavity
H01S3/14	Characterised by the material used as the active medium
H01S3/16	Solid materials
H01S5/00	Semiconductor lasers
H01T	Spark gaps; Overvoltage arresters using spark gaps; Sparking plugs; Corona devices; Generating ions to be introduced into non-enclosed gases
H01T13/00	Sparking-plugs
H01T15/00	Circuits specially adapted for spark gaps, e.g. ignition circuits
H01T23/00	Apparatus for generating ions to be introduced into non-enclosed gases, e.g. into the atmosphere
H02	Generation, conversion, or distribution of electric power
H02B	Boards, substations, or switching arrangements for the supply or distribution of electric power
H02B1/00	Frameworks, boards, panels, desks, casings; Details of substations or switching arrangements
H02B1/20	Bus-bar or other wiring layouts, e.g. in cubicles, in

	switchyards
H02B13/00	Arrangement of switchgear in which switches are enclosed in, or structurally associated with, a casing, e.g. cubicle
H02B13/035	Gas-insulated switchgear
H02G	Installation of electric cables or lines, or of combined optical and electric cables or lines
H02G1/00	Methods or apparatus specially adapted for installing, maintaining, repairing, or dismantling electric cables or lines
H02G1/06	For laying cables, e.g. laying apparatus on vehicle
H02G1/14	For joining or terminating cables
H02G3/00	Installations of electric cables or lines or protective tubing therefor in or on buildings, equivalent structures or vehicles
H02G3/04	Protective tubing or conduits, e.g. cable ladders, cable troughs
H02G7/00	Overhead installations of electric lines or cables
H02G7/02	Devices for adjusting or maintaining mechanical tension, e.g. take-up device
H02G7/20	Spatial arrangements or dispositions of lines or cables on poles, posts, or towers
H02G13/00	Installations of lightning conductors; Fastening thereof to supporting structure
H02H	Emergency protective circuit arrangements
H02H1/00	Details of emergency protective circuit arrangements
H02H3/00	Emergency protective circuit arrangements for automatic disconnection directly responsive to an undesired change from normal electric working condition, with or without subsequent reconnection
H02H3/08	Responsive to excess current
H02H3/20	Responsive to excess voltage
H02H7/00	Emergency protective circuit arrangements specially adapted for specific types of electric machines or apparatus or for sectionalised protection of cable or line systems, and effecting automatic switching in the event of an undesired change from normal working conditions
H02H7/04	For transformers
H02H7/06	For dynamo-electric generators; For synchronous capacitors
H02H7/08	For dynamo-electric motors
H02J	Circuit arrangements or systems for supplying or distributing electric power; Systems for storing electric energy
H02J7/00	Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries
H02J9/00	Circuit arrangements for emergency or stand-by power supply, e.g. for emergency lighting
H02J15/00	Systems for storing electric energy
H02J17/00	Systems for supplying or distributing electric power by electromagnetic waves

H02K	Dynamo-electric machines
H02K1/00	Details of the magnetic circuit
H02K1/12	Stationary parts of the magnetic circuit
H02K3/00	Details of windings
H02K13/00	Structural associations of current collectors with motors or generators, e.g. brush mounting plates, connections to windings; Disposition of current collectors in motors or generators; Arrangements for improving commutation
H02K13/14	Circuit arrangements for improvement of commutation, e.g. by use of unidirectionally conductive element
H02K17/00	Asynchronous induction motors; Asynchronous induction generators
H02K17/02	Asynchronous induction motors
H02K17/16	Having rotor with internally short-circuited windings, e.g. cage rotor
H02K17/42	Asynchronous induction generators
H02K19/00	Synchronous motors or generators
H02K19/02	Synchronous motors
H02K19/16	Synchronous generators
H02K23/00	Dc commutator motors or generators having mechanical commutator; Universal ac/dc commutator motors
H02K26/00	Machines adapted to function as torque motors, i.e. to exert a torque when stalled
H02K27/00	Ac commutator motors or generators having mechanical commutator
H02K31/00	Acyclic motors or generators, i.e. dc machines having a drum or disc armature with continuous current collectors
H02K37/00	Motors with rotor rotating step by step and without interrupter or commutator driven by the rotor, e.g. stepping motors
H02K41/00	Propulsion systems in which a rigid body is moved along a path due to dynamo-electric interaction between the body and a magnetic field travelling along the path
H02K41/02	Linear motors; Sectional motors
H02K41/025	Asynchronous motors
H02K41/03	Synchronous motors; Motors moving step by step; Reluctance motors
H02K55/00	Dynamo-electric machines having windings operating at cryogenic temperatures
H02M	Apparatus for conversion between ac and ac, between ac and dc, or between dc and dc, and for use with mains or similar power supply systems; Conversion of dc or ac input power into surge output power; Control or regulation thereof
H02M1/00	Details of apparatus for conversion
H02M1/12	Arrangements for reducing harmonics from ac input or output

H02M3/00	Conversion of dc power input into dc power output
H02M5/00	Conversion of ac power input into ac power output, e.g. for change of voltage, for change of frequency, for change of number of phases
H02M7/00	Conversion of ac power input into dc power output; Conversion of dc power input into ac power output
H02N	Electric machines not otherwise provided for
H02N1/00	Electrostatic generators or motors using a solid moving electrostatic charge carrier
H02N2/00	Electric machines in general using piezo-electric effect, electrostriction or magnetostriction
H02N2/10	Producing rotary motion, e.g. rotary motors
H02N2/18	Producing electrical output from mechanical input, e.g. generators
H02N6/00	Generators in which light radiation is directly converted into electrical energy
H02P	Control or regulation of electric motors, generators, or dynamo-electric converters; Controlling transformers, reactors or choke coils
H02P21/00	Arrangements or methods for the control of electric machines by vector control, e.g. by control of field orientation
H03	Basic electronic circuitry
H03B	Generation of oscillations, directly or by frequency-changing, by circuits employing active elements which operate in a non-switching manner; Generation of noise by such circuits
H03B5/00	Generation of oscillations using amplifier with regenerative feedback from output to input
H03B5/08	With frequency-determining element comprising lumped inductance and capacitance
H03B5/32	Being a piezo-electric resonator
H03B9/00	Generation of oscillations using transit-time effects
H03B19/00	Generation of oscillations by non-regenerative frequency multiplication or division of a signal from a separate source
H03B23/00	Generation of oscillations periodically swept over a predetermined frequency range
H03B25/00	Simultaneous generation by a free-running oscillator of oscillations having different frequencies
H03B29/00	Generation of noise currents and voltages
H03C	Modulation
H03D	Demodulation or transference of modulation from one carrier to another
H03F	Amplifiers
H03F1/00	Details of amplifiers with only discharge tubes, only semiconductor devices or only unspecified devices as amplifying elements
H03F1/26	Modifications of amplifiers to reduce influence of noise generated by amplifying elements

H03F1/32	Modifications of amplifiers to reduce non-linear distortion
H03F3/00	Amplifiers with only discharge tubes or only semiconductor devices as amplifying elements
H03F3/181	Low-frequency amplifiers, e.g. audio preamplifiers
H03F3/189	High-frequency amplifiers, e.g. radio frequency amplifiers
H03F3/20	Power amplifiers, e.g. class b amplifiers, class c amplifiers
H03F3/34	Dc amplifiers in which all stages are dc-coupled
H03F3/45	Differential amplifiers
H03F3/54	Amplifiers using transit-time effect in tubes or semiconductor devices
H03F3/60	Amplifiers in which coupling networks have distributed constants, e.g. with waveguide resonators
H03F7/00	Parametric amplifiers
H03F9/00	Magnetic amplifiers
H03G	Control of amplification
H03G3/00	Gain control in amplifiers or frequency changers
H03G3/20	Automatic control
H03H	Impedance networks, e.g. resonant circuits; Resonators
H03H7/00	Multiple-port networks comprising only passive electrical elements as network components
H03H7/01	Frequency selective two-port networks
H03H7/075	Ladder networks, e.g. electric wave filters
H03H7/30	Time-delay networks
H03H7/38	Impedance-matching networks
H03H11/00	Networks using active elements
H03H11/02	Multiple-port networks
H03H11/04	Frequency selective two-port networks
H03H11/26	Time-delay networks
H03H15/00	Transversal filters
H03H17/00	Networks using digital techniques
H03H17/04	Recursive filters
H03J	Tuning resonant circuits; Selecting resonant circuits
H03J7/00	Automatic frequency control; Automatic scanning over a band of frequencies
H03J7/02	Automatic frequency control
H03K	Pulse technique
H03K3/00	Circuits for generating electric pulses; Monostable, bistable or multistable circuits
H03K4/00	Generating pulses having essentially a finite slope or stepped portions
H03K5/00	Manipulating pulses not covered by one of the other main groups in this subclass
H03K5/01	Shaping pulses

H03K5/14	By the use of delay lines
H03K19/00	Logic circuits, i.e. having at least two inputs acting on one output; Inverting circuits
H03K19/082	Using bipolar transistors
H03K19/086	Emitter coupled logic
H03K19/094	Using field-effect transistors
H03K19/0944	Using mosfet
H03K19/0948	Using cmos
H03K19/177	Arranged in matrix form
H03M	Coding, decoding or code conversion, in general
H03M1/00	Analogue/digital conversion; Digital/analogue conversion
H03M1/12	Analogue/digital converters
H03M1/66	Digital/analogue converters
H03M3/00	Conversion of analogue values to or from differential modulation
H03M3/02	Delta modulation, i.e. one-bit differential modulation
H03M13/00	Coding, decoding or code conversion, for error detection or error correction; Coding theory basic assumptions; Coding bounds; Error probability evaluation methods; Channel models; Simulation or testing of codes
H04	Electric communication technique
H04B	Transmission
H04B1/00	Details of transmission systems, not covered by a single one of groups H04B3/00 to H04B13/00; Details of transmission systems not characterised by the medium used for transmission
H04B1/02	Transmitters
H04B1/06	Receivers
H04B1/26	For superheterodyne receivers
H04B1/38	Transceivers, i.e. devices in which transmitter and receiver form a structural unit and in which at least one part is used for functions of transmitting and receiving
H04B1/59	Responders; Transponders
H04B1/69	Spread spectrum techniques in general
H04B1/707	Using direct sequence modulation
H04B1/74	For increasing reliability, e.g. using redundant or spare channels or apparatus
H04B3/00	Line transmission systems
H04B3/36	Repeater circuits
H04B3/54	Systems for transmission via power distribution lines
H04B5/00	Near-field transmission systems, e.g. inductive loop type
H04B7/00	Radio transmission systems, i.e. using radiation field
H04B7/02	Diversity systems
H04B7/185	Space-based or airborne stations

H04B7/204	Multiple access
H04B7/212	Time-division multiple access
H04B10/00	Transmission systems employing beams of corpuscular radiation, or electromagnetic waves other than radio waves, e.g. light, infra-red
H04B10/02	Details
H04B10/04	Transmitters
H04B10/06	Receivers
H04B10/10	Transmission through free space, e.g. through the atmosphere
H04B10/12	Transmission through light guides, e.g. optical fibres
H04B10/16	Repeaters
H04B11/00	Transmission systems employing ultrasonic, sonic or infrasonic waves
H04B13/00	Transmission systems characterised by the medium used for transmission, not provided for in groups H04B3/00 to H04B11/00
H04H	Broadcast communication
H04J	Multiplex communication
H04J1/00	Frequency-division multiplex systems
H04J3/00	Time-division multiplex systems
H04J11/00	Orthogonal multiplex systems
H04J13/00	Code multiplex systems
H04J14/00	Optical multiplex systems
H04J14/02	Wavelength-division multiplex systems
H04K	Secret communication; Jamming of communication
H04K1/00	Secret communication
H04K3/00	Jamming of communication; Counter-measures
H04L	Transmission of digital information, e.g. telegraphic communication
H04L1/00	Arrangements for detecting or preventing errors in the information received
H04L1/02	By diversity reception
H04L9/00	Arrangements for secret or secure communication
H04L12/00	Data switching networks
H04L12/04	Switchboards
H04L12/10	Current supply arrangements
H04L12/28	Characterised by path configuration, e.g. lan [local area networks] or wan [wide area networks]
H04L12/50	Circuit switching systems, i.e. systems in which the path is physically permanent during the communication
H04L12/54	Stored and forward switching systems
H04L12/56	Packet switching systems

H04L12/58	Message switching systems
H04L12/66	Arrangements for connecting between networks having differing types of switching systems, e.g. gateways
H04L29/00	Arrangements, apparatus, circuits or systems, not covered by a single one of groups h04I0001000000 to h04I0027000000
H04L29/02	Communication control; Communication processing
H04M	Telephonic communication
H04M1/00	Substation equipment, e.g. for use by subscribers
H04M1/02	Constructional features of telephone sets
H04M3/00	Automatic or semi-automatic exchanges
H04M19/00	Current supply arrangements for telephone systems
H04N	Pictorial communication, e.g. television
H04N1/00	Scanning, transmission or reproduction of documents or the like, e.g. facsimile transmission; Details thereof
H04N1/41	Bandwidth or redundancy reduction
H04N5/00	Details of television systems
H04N5/222	Studio circuitry; Studio devices; Studio equipment
H04N5/225	Television cameras
H04N5/232	Devices for controlling television cameras, e.g. remote control
H04N5/28	Mobile studios
H04N5/30	Transforming light or analogous information into electric information
H04N5/32	Transforming x-rays
H04N5/33	Transforming infra-red radiation
H04N5/38	Transmitter circuitry
H04N5/44	Receiver circuitry
H04N5/52	Automatic gain control
H04N5/66	Transforming electric information into light information
H04N5/74	Projection arrangements for image reproduction, e.g. using eidophor
H04N5/76	Television signal recording
H04N5/78	Using magnetic recording
H04N5/781	On discs or drums
H04N5/782	On tape
H04N5/7822	With stationary magnetic heads
H04N5/84	Using optical recording
H04N5/89	Using holographic recording
H04N5/907	Using static stores, e.g. storage tubes, semiconductor memories
H04N7/00	Television systems
H04N7/01	Conversion of standards
H04N7/015	High-definition television systems

H04N7/025	Systems for transmission of digital non-picture data, e.g. of text during the active part of a television frame
H04N7/18	Closed-circuit television systems, i.e. systems in which the signal is not broadcast
H04N7/20	Adaptations for transmission via a ghz frequency band, e.g. via satellite
H04N7/22	Adaptations for optical transmission
H04N9/00	Details of colour television systems
H04N9/16	Using cathode ray tubes
H04Q	Selecting
H04Q9/00	Arrangements in telecontrol or telemetry systems for selectively calling a substation from a main station, in which substation desired apparatus is selected for applying a control signal thereto or for obtaining measured values therefrom
H04R	Loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers; Deaf-aid sets; Public address systems
H04R1/00	Details of transducers
H04R1/44	Special adaptations for subaqueous use, e.g. for hydrophone
H04R25/00	Deaf-aid sets
H04W	Wireless communication networks
H04W4/00	Services or facilities specially adapted for wireless communication networks
H04W4/12	Messaging, e.g. sms [short messaging service]; Mailboxes; Announcements, e.g. informing users on the status or progress of a communication request
H04W8/00	Network data management
H04W8/02	Processing of mobility data, e.g. registration information at hlr [home location register] or vlr [visitor location register]; Transfer of mobility data, e.g. between hlr, vlr or external networks
H04W12/00	Security arrangements, e.g. access security or fraud detection; Authentication, e.g. verifying user identity or authorisation; Protecting privacy or anonymity
H04W16/00	Network planning, e.g. coverage or traffic planning tools; Network deployment, e.g. resource partitioning or cell structures
H04W28/00	Network traffic or resource management
H04W28/02	Traffic management, e.g. flow control or congestion control
H04W28/16	Central resource management; Negotiation of resources, e.g. negotiating bandwidth or qos [quality of service]
H04W40/00	Communication routing or communication path finding
H04W64/00	Locating users or terminals for network management purposes, e.g. mobility management
H04W72/00	Local resource management, e.g. selection or allocation of wireless resources or wireless traffic scheduling

H04W74/00	Wireless channel access, e.g. scheduled or random access
H04W84/00	Network topologies
H04W88/00	Devices specially adapted for wireless communication networks, e.g. terminals, base stations or access point devices
H05	Electric techniques not otherwise provided for
H05B	Electric heating; Electric lighting not otherwise provided for
H05B1/00	Details of electric heating devices
H05B3/00	Ohmic-resistance heating
H05B6/00	Heating by electric, magnetic, or electromagnetic fields
H05B6/02	Induction heating
H05B6/64	Heating using microwaves
H05B6/80	Apparatus for specific applications
H05B7/00	Heating by electric discharge
H05B31/00	Electric arc lamps
H05B33/00	Electroluminescent light sources
H05B37/00	Circuit arrangements for electric light sources in general
H05B37/02	Controlling
H05B41/00	Circuit arrangements or apparatus for igniting or operating discharge lamps
H05B41/30	In which the lamp is fed by pulses, e.g. flash lamp
H05C	Electric circuits or apparatus specially designed for use in equipment for killing, stunning, enclosing or guiding living beings
H05F	Static electricity; Naturally-occurring electricity
H05G	X-ray technique
H05H	Plasma technique; Production of accelerated electrically- charged particles or of neutrons; Production or acceleration of neutral molecular or atomic beams
H05H1/00	Generating plasma; Handling plasma
H05H1/02	Arrangements for confining plasma by electric or magnetic fields; Arrangements for heating plasma
H05H1/24	Generating plasma
H05H1/26	Plasma torches
H05H1/46	Using applied electromagnetic fields, e.g. high frequency or microwave energy
H05H3/00	Production or acceleration of neutral particle beams, e.g. molecular or atomic beams
H05H6/00	Targets for producing nuclear reactions
H05H9/00	Linear accelerators
H05H11/00	Magnetic induction accelerators, e.g. betatrons
H05H13/00	Magnetic resonance accelerators; Cyclotrons
H05H13/04	Synchrotrons

H05H15/00	Methods or devices for acceleration of charged particles not otherwise provided for
H05K	Printed circuits; Casings or constructional details of electric apparatus; Manufacture of assemblages of electrical components
H05K1/00	Printed circuits
H05K3/00	Apparatus or processes for manufacturing printed circuits
H05K9/00	Screening of apparatus or components against electric or magnetic fields
H05K13/00	Apparatus or processes specially adapted for manufacturing or adjusting assemblages of electric components