

42 Instruments, counting, computing, controlling

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- 42a** Mathematical drawing instruments: compasses, ruling pens, curve-drawing instruments; miscellaneous drawing instruments
- 42b** Measuring instruments: length and thickness measuring instruments, dividing devices, tree-measuring calipers, measuring and testing instruments for shop use
- 42c** Measuring instruments for geodetic, nautical, aeronautical and geophysical purposes, including accessories; photogrammetry
- 42d** General purpose devices for the indication and recording of data
- 42e** Quantity-measuring devices
- 42f** Scales and weighing devices
- 42f** (IPC: G01G) Weighing
- 42g** Acoustics, especially sound recording and reproduction
- 42h** Optics, including microtomes, photometers and colorimeters
- 42i** Thermometers: air, liquid and metal thermometers, electric thermometers; optical pyrometers; thermostatically controlled cabinets, water baths; measurement of heat conductivity, heat expansion, heat transfer and heat transmission, measurement of coefficients of fusion and boiling points; calorimeters; heat measuring devices; humidity meters, meteorological instruments
- 42k** Force-measuring devices, pressure gauges, indicators, test tunnels; test stands; testing devices for springs, for tools, for measuring material bending and for the determination of the load capacity of foundation soils; road-testing machines; leakage detectors; balancing machines; testing of metallic materials and of non-metallic solid materials
- 42l** Chemical and physical methods and apparatus for testing materials
- 42m** Computers: slide rules, disk calculators, computing tables, calculating machines
- (42m (IPC: G06) Computing; Calculating; Counting
- 42m1** (IPC: G06C) Digital computers in which all the computation is effected mechanically
- 42m2** (IPC: G06D) Digital fluid-pressure computing devices
- 42m3** (IPC: G06F) Digital computers in which at least part of the computation is effected electrically; Arrangements for handling digital data
- 42m4** (IPC: G06G) Analogue computers
- 42m5** (IPC: G06J) Hybrid computing arrangements

42m6	(IPC: G06K) Recognition of data; Presentation of data; Record carriers; Handling record carriers
42m7	(IPC: G06M) Counting mechanisms; counting of objects not otherwise provided for
42n	Teaching and demonstration aids; perpetual calendars; synoptic tables, coding and decoding devices
42o	Speed measuring devices
42p	Counting devices, distance measuring devices, fare indicating devices, fare recorders
42q	Automatic regulators, including program control devices for physical state values, i.e. pressure, temperature, density, of general application
42r	Automatic non-electric regulators for any controlled conditions and for general application
(42r	(IPC: G05) Controlling; Regulating
42r1	(IPC: G05B) Control or regulating systems in general; Functional elements of such systems; Monitoring or testing arrangements for such systems or elements
42r2	(IPC: G05D) Systems for controlling or regulating non-electric variables
42r3	(IPC: G05F) Systems for regulating electric or magnetic variables
42r4	(IPC: G05G) Control devices or systems insofar as characterised by mechanical features only
42s	Devices and methods for the generation of mechanical oscillations, performing engineering work by means of oscillations, oscillating systems for general purposes, also ultrasound generators
42s	(IPC: B06B) Methods and apparatus for generating and/or transmitting mechanical vibrations of infrasonic, sonic or ultrasonic frequency for performing mechanical work in general
(42t	Information storage)
42t1	(IPC: G11B) Information storage based on relative movement between record carrier and transducer
42t2	(IPC: G11C) Static stores
42a	Mathematical drawing instruments: compasses, ruling pens, curve-drawing instruments; miscellaneous drawing instruments (drawing implements, general 70a, 70e; drawing-instrument sets mentioned under the various parts: compasses, ruling pens, etc.)
	Compasses
42a-1	Measuring compasses, caliper compasses (42b-9)
42a-2	Parallel-leg compasses
42a-3	Beam compasses

42a-4/01 Bow compasses
 42a-4/02 Proportional compasses
 42a-4/03 Multiple-knee compasses
 42a-4/04 Miscellaneous compasses
 42a-5 Compass attachments
 42a-7 Compass joints

Ruling pens

42a-9/01 Ordinary ruling pens
 42a-9/02 Ruling pens similar to writing pens
 42a-9/03 Uniform stroke pens
 42a-9/04 Dotted pens
 42a-9/05 Miscellaneous ruling pens
 42a-9/06 Ruling-pen fillers, also India-ink containers
 42a-10 Fountain-drawing pens

Curve-drawing instruments

42a-11 Instruments for the drawing of conic sections
 42a-12 Ellipsographs
 42a-13 Instruments for drawing spirals
 42a-14/01 Instruments for drawing specific mathematical curves
 42a-14/02 Instruments for drawing arcs of circles
 42a-14/03 Miscellaneous curve-drawing instruments
 42a-15 French curves

Miscellaneous drawing instruments

42a-16 Pantographs
 42a-17 Instruments for geometric drawing
 42a-18 Optical drawing instruments
 42a-19 Instruments for drawing from nature
 42a-20 Other miscellaneous drawing instruments

42b Measuring instruments: length and thickness measuring instruments, dividing devices, tree-measuring calipers, measuring and testing instruments for shop use, e.g. calipers and gauges (shape-and-form-measuring instruments 75a-17)

Devices for measuring lengths (counters 42p-7)

42b-1 Folding measuring rulers
 42b-2 Sliding measuring rulers
 42b-3 Miscellaneous non-folding rulers
 42b-4 Measuring tapes and cables
 42b-5 Measuring devices for ropes, tapes and similar indeterminate-length materials, (for textile webs and strips, lace 8f-1 – 8f-4)
 42b-6 Measuring wheels
 42b-7/01 Devices for measuring the length of living beings and devices for identification services (30a-4)
 42b-7/02 Fingerprinting and the like
 Miscellaneous length-measuring devices (measuring the thermal expansion 42 i-12; dilatometers 42k-20/01, 42k-45/01 – 42k-45/05)
 42b-8/01 Length-measuring machines and comparators
 42b-8/02 Manufacture and calibration of gauge blocks (surface testing 42b-12/05), comparison interferometers

Thickness-measuring and aperture-measuring devices (taper gauges 42b-21/02; gauges for internal measurements, inside caliper gauges and the like 42b-22/03)

- 42b-9 Feeler gauges and calipers for measuring of thicknesses and apertures (42a-1)
- 42b-10 Wire gauges and the like (for textile fabrics 86h-8)
- 42b-11 Thickness gauges for sheet metal, paper, leather and the like, also gauges for measuring wall thicknesses
- 42b-12/01 Mechanical feeler gauges, dial gauges, micrometers
- 42b-12/02 Optical feeler gauges
- 42b-12/03 Electrical thickness and aperture measuring devices
- 42b-12/04 Diaphragm gauges and gauges for capillaries
- 42b-12/05 Surface-testing instruments
- 42b-12/06 Miscellaneous thickness and aperture measuring devices, also finger-ring gauges
- 42b-13 Tree-measuring devices, calipers, and the like (tree-height measuring devices with sights 42c-6/02)

Dividing devices

- 42b-14 Length-dividing devices
- 42b-15 Angle-and circle-dividing devices
- 42b-16 Miscellaneous dividing devices, also dividing machines (indexing heads and devices for metal-working machines 49b-13; for the manufacture of gear wheels 49d-15/04)

Measuring and testing tools for shop use

- 42b-17 Calibrating instruments and gauges nonadjustable during measurement; gauges with interchangeable and adjustable jaws (tolerance gauges 42b-22/02)
- 42b-18 Vernier calipers
- 42b-19 Screw gauges, micrometers
- 42b-20 Screw-thread gauges
- 42b-21/01 Angle-measuring devices, bevels, inclination measuring devices
- 42b-21/02 Taper gauges
- 42b-22/01 Depth gauges
- 42b-22/02 Tolerance gauges
- 42b-22/03 Inside caliper gauges, diameter gauges for internal and external measurements (centring devices also 42b-23/04)
- 42b-22/04 Gauges for railway rails, wheels (measuring devices, for tyres, flanges 20h-1)
- 42b-22/05 Gauges for drills
- 42b-22/06 Miscellaneous gauges (gauges for the manufacture of aircraft propellers 62c-11)
- 42b-23/01 Marking gauges, parallel scribes and other measuring scribes
- 42b-23/02 Scriber points and fastening thereof
- 42b-23/03 Markers for beams, boards, shingles (markers for stair steps 37d-40)
- 42b-23/04 Centring devices (with punches 49a-67)
- 42b-24 Measuring devices combined with machine tools, also gauges for cutting, milling and other tools
- 42b-25 Hit measuring devices for the use of marksmen
- 42b-26/01 Machines for sorting workpieces, gauging machines
- 42b-26/02 Testing devices for racks and pinions
- 42b-26/03 Miscellaneous measuring instruments, section projectors

- 42c Measuring instruments for geodetic, nautical, aeronautical and geophysical purposes, including accessories; photogrammetry**
- 42c Measuring instruments for geodetic, nautical, aeronautical and geophysical purposes, including accessories; photogrammetry (stands and supports in general 47a2-11/00 – 47a2-13/08)**
- Stands**
- 42c-1/01 Stands for surveying instruments and small cameras, including aerial cameras, cameras in general, and cane stands for chemical and laboratory apparatus 42l-13; musical stands 51e-8; for photographic studio cameras 57a-10/03; special devices for motion picture projectors 57a-59)
- 42c-1/02 Brackets, tree and similar stands
- 42c-2/01 Tripods (telescopic tubes for lamps 4a-27)
- 42c-2/02 Protection of tripods against slipping and bracing of tripod feed (protection of walking sticks against slipping 33a-11/03; of crutches 30f-4)
- 42c-3/01 Assembly of the tripod legs on the tripod head and arrangements for mounting instruments on the tripod; double thread arrangements, rapid fasteners and the like
- 42c-3/02 Adjusting devices on the tripod head and tripod adapters, ball-and-socket joints, tilt heads, swivel arrangements (levelling screws for surveying instruments 42c-5/03)
- 42c-4 Simple angle-measuring instruments, protractors, angle-measuring instruments with swivel arms and graduated arcs and the like, exclusive of 42c-5 – 42c-13, 42c-24, 42c-25, 42c-32 – 42c-40 (angle-measuring instruments and aiming devices for ballistic purposes, bomb launching and the like 72f-15; triangles 70e-10/01; shop-use angle gauges 42b-21/01; angle gauges for propellers 62c-11)
- Surveying instruments**
- 42c-5/01 Angle-measuring instruments with telescopes, theodolites, balloon and recording theodolites, alidades and the like (telescopes for astronomical observatories and their mounting 42h-10/03; radio height and distance measuring 21a4-48/61 – 21a4-48/63)
- 42c-5/02 Graduated circle reading arrangements, verniers, optical micrometers and the like for surveying and nautical instruments
- 42c-5/03 Levelling mechanisms on surveying instruments, optical sounding (plumb lines and bobs 42c-11/02), illumination, cross-hairs and similar special arrangements on surveying instruments (bubble level arrangements 42c-6/01; compass arrangements 42c-7/01; tachymeter arrangements 42c-8)
- 42c-6/01 Vertical-angle measuring instruments with aiming devices exclusive of 42c-5/01; bubble levels and similar arrangements on surveying instruments (inclination measuring on moving bodies 42c-25; on bodies at rest 42c-24; barometric height measurement 42k-9/03, 42k-11/02; measurement of the height of wire lines 42k-27; measurement of the distance of aircrafts from ground level 42c-40; radio height and distance measurement 21a4-48/61 – 21a4-48/63)
- 42c-6/02 Tree-height measuring devices (calipers for measuring trees 42b-13)
- 42c-6/03 Pendulum mounts for measuring instruments, pendulum stands, pendulum levelling instruments and the like
- 42c-7/01 Mounting of compasses on surveying instruments and orientation compasses (compass structures 42c-32 – 42c-36)
- 42c-7/02 Plane tables, sketching and similar field-surveying instruments, exclusive of 42c-5/01 – 42c-7/01, also surveying instruments in the form of rods
- 42c-7/03 Static-rod heads, angle prisms, periscopes
- 42c-7/04 Special instruments for mining surveyors: miners' hanging dials, clinometer compasses and the like (devices for the measurement of the inclination of bore holes 5a-18)
- 42c-8 Tachymeter arrangements: surveyors' rods, devices for reading reduced values and the like (mapping devices for same 42c-9/03; surveyors' rods 42c-11/01; telemeters 42c-14 – 42c-23)

- 42c-9/01 Special instruments for profile measurement, pole attachments and the like, exclusive of 42c-6/01, 42c-24, 42c-25, recording profile-measuring devices
- 42c-9/02 Automatically mapping vehicles: distance and direction (recording compasses 42c-34; distance recorders 42p-11/50)
- 42c-9/03 Mapping devices combined with telemeters, tachygraphs

Photogrammetry

- 42c-10/01 Measuring arrangements combined with photographic cameras, phototheodolites, measuring markers and the like (aerial photographic cameras 57a-7/07)
- 42c-10/02 Surveying, mapping and other instruments for photogrammetric pictures (distortion-correcting instruments 57a-5/09; comparators in general 42b-8)
- 42c-10/03 Photogrammetric methods: orientation, radial line methods and the like
- 42c-10/04 Photogrammetric methods and instruments for various purposes: body measurement from scale drawings (directly from the human body, 30a-4/06; 42b-7/01) and body representation (photosculpture) by means of photogrammetric pictures (photochemically 57b, 20), measuring of X-ray pictures (other position-determining methods in X-ray radiographs 21g-18, 21g-19, 30a-6/08; stereoscopic projection of X-ray pictures 42h-23/14; photographic speed measurement 42o-19)

Auxiliary surveying instruments and accessories

- 42c-11/01 Surveyors' rods and accessories
- 42c-11/02 Plump and bobs (optical sounding 42c-5/03)
- 42c-11/03 Staking out devices, range poles and the like, markers, monuments, wall-stakes, signals, heliotropes (manhole covers 85e-11/01; measuring tapes 42b-4)
- 42c-11/04 Coordinate-measuring devices (coordinate instruments for artillery purposes 72f-15)
- 42c-11/05 Map protractors and distance-measuring devices (measuring wheels 42b-6)

Planimeters and other instruments for the evaluation of continuous curves

- 42c-12 Surface-measuring instruments in general, planimeters, integrimeters, integragraphs, devices for harmonic analysis and differentiating devices for continuous curves (integrators for measured values 42d-10; harmonic analysers for electric magnitudes 21e-11/20)
- 42c-13 Surface-measuring machines for leather and the like

Devices and methods for measuring distances

- 42c-14 Telemeters with the base line at the station and two separate observation posts, also with parallel displacement of one of the sighting devices
- 42c-15 Telemeters with the base line at the station and one observation post
- 42c-16 Telemeters with the base line at the target (tachymeters 42c-8)
- 42c-17/01 Split-field range finders, exclusive of 42c-20
- 42c-17/05 Inverted-image range finders, exclusive of 42c-20
- 42c-17/10 Stereoscopic range finders, exclusive of 42c-20
- 42c-17/15 Miscellaneous optical range finders (tachymeters 42c-8)
- 42c-17/20 Prisms and prism combinations for optical range finders
- 42c-17/25 Adjusting devices for optical range finders
- 42c-18 Devices and methods for distance measurement operating according to the transit time method utilising radiated wave energy, insofar as not related to the structure of the high-frequency part (21a4-48/61; acoustic echo sounders 74d-6/15)
- 42c-19 Range finders with comparison scales on the instrument (tachymeters 42c-8)
- 42c-20 Range finders for moving targets (artillery-control instruments 72f-15/05)
- 42c-21 Range finders combined with other instruments (on guns 72f-12/01)
- 42c-22 Miscellaneous distance measuring devices and methods
- 42c-23 Miscellaneous details of telemeters and range finders, exclusive of 42c-17/20, 42c-17/25

Inclination-measuring instruments for stationary bodies, without aiming devices (with aiming devices 42c-6/01; inclination-measuring instruments for moving bodies, vehicles and the like 42c-25; for bore holes 5a-18/10; for photographic cameras 57a-10/05)

- 42c-24/01 Bubble levels, generally and for plumb rules (for surveying instruments and telescopes 42c-6/01)
- 42c-24/02 Water levels
- 42c-24/03 Plumb rules with bubble levels or water levels
- 42c-24/04 Levels with pendulums (plumb lines and bobs 42c-11/02)
- 42c-24/05 Plumb rules with rollers

Devices for determining and obtaining inclinations, e.g. of the true vertical on moving bodies, vehicles (72f-15/08; damping of the rolling of ships 65a2-55 – 65a2-59, 65a2-65; stabilisation of aircrafts 62b-11 – 62b-14; artificial horizons for sextants 42c-38)

- 42c-25/01 Instruments operating only in response to pendulums, liquids, rollers, or to dynamic pressure, in particular inclinometers for aircraft, ships and motor vehicles
- 42c-25/50 Instruments with gyroscopes, artificial horizons and the like
- 42c-25/51 Driving gear and bearings for gyroscopes in gyroscopic measuring instruments

Instruments for surveying waters

- 42c-26/01 Water gauges
- 42c-26/02 Underground-water gauges
- 42c-27 Flow direction indicators (flow direction indicators for cir streams 42c-41, 74b-7/50, 74d-10/04; flow velocity meters 42o-15; for flow rate meters 42e)

Depth-measuring devices (depth gauges 42b-22/01)

- 42c-28 Electric depth-measuring devices
- 42c-29 Manometric and pneumatic depth-measuring devices
- 42c-30/01 Acoustic depth-measuring devices (echo sounders 74d-6/15)
- 42c-30/10 Miscellaneous depth-measuring devices
- 42c-31 Sounding lines and sounding machines (plumb lines and bobs 42c-11/02)

Compasses (74b-7/01; compasses used as surveying instruments 42c-7/01)

- 42c-32/01 Magnetic compasses: floating and dry compasses (determination of the declination, etc. 42c-3)
- 42c-32/10 Arrangements for the compensation for deviation-causing perturbations
- 42c-33 Reading devices for compasses
- 42c-34 Recording compasses (42c-9/01 – 42c-9/03, 42c-39/10)
- 42c-35/01 Directional gyroscopic compasses (gyro-inclinometers and the like 42c-25)
- 42c-35/10 Non-directional gyroscopic direction and turn indicators, azimuth gyroscopes, gyroscopic turn and bank indicators (angular- velocity measuring devices with gyroscopes 42o-13/03)
- 42c-35/50 Compasses operating on the basis of the effect of the terrestrial magnetic field in combination with gyroscopic devices
- 42c-36 Miscellaneous compasses, exclusive of magnetic and gyroscopic compasses: induction compasses, sun compasses and the like (radio direction finders 21a4-48)

Instruments for determining position, also of ships, and the astronomical time, and other navigation instruments

- 42c-37 Sextants and the like (other angle-measuring devices with telescopes 42c-5/01)
- 42c-38 Artificial horizons for sextants (gyroscopic horizons and the like 42c-25/01 – 42c-25/51)
- 42c-39/01 for astronomical time and position determination (telescopes and their mounting 42h-10 – 42h-13)
- 42c-39/05 Telescopes with position indication (coin-operated 43b-34)

- 42c-39/10 Position indicators for vehicles (vehicles with automatic map making devices 42c-9/02; recording distances 42p-11/50)
- 42c-39/15 Determination of the position of bodies by means of heat rays (electric locating 21a4-48/31)
- 42c-39/20 Direction and position determination by measuring changes in-the intensity of optical radiation
- 42c-40/01 Devices for measuring the distance of aircraft from the ground, from aircraft (barometers 42k-8 – 42k-14; radio altitude and range measuring devices 21a4-48/61 – 21a4-48/63)
- 42c-40/05 Devices for measuring the distance of aircraft from the ground as measured from the ground (balloon theodolites 42c-5/01; other vertical angle measuring devices with line of sight 42c-6/01; radio latitude and range measurement 21a4-48/61 – 21a4-48/63)
- 42c-41 Instruments for course determination by means of bearings, for graphical course determination, course-triangle calculators, drift indicators (radio location 21a4-48)
- Geophysical instruments** (instruments for measuring electric magnitudes, also radioactivity 21g-30)
- 42c-42 Seismographs and other instruments for measuring mechanical vibrations and tremors, also in buildings and machines (vehicle testing with devices recording vibrations 42p-13/10; sound oscillations 42g, electric oscillations 21e-7 – 21e-11; oscillation measuring devices for ships 65a2-65; balancing machines 42k-32, 42k-33)
- 42c-43 Devices for determining the declination, deviation, inclination, and the intensity components and their variations: magnetic field balances and the like (magnetic compasses 42c-32)
- 42c-44 Gravimetric measuring instruments for the investigation of the earth crust density and gravity: torsion balances, gravity pendulums and the like (physical determination of density 42l-1, 42l-2)
- 42c-45 Miscellaneous geophysical methods of measurement, excluding the measurement of electric magnitudes, e.g. by heat measurement, trapping earth gases, also dowsing rods, sidereal pendulums
- 42d General-purpose devices for the indication and recording of data**
(42b; 42c; 42e – 42p; 21e; 43a; 74a; 74b; 74c)
- Design of general-purpose instruments indicating instantaneous values, independent of the indicating and recording device**
- 42d-1/01 Arrangements for connecting measuring device with the indicating or recording device without the utilisation of auxiliary power; devices for the variation of the transmission ratio, straight-motion guides and the like (bearings for precision drives and guides for the moving parts of fine mechanics of general application 47i-1, 47i-3)
- Arrangements for the indirect connection of measuring mechanisms with indicating or recording devices
- 42d-1/10 using auxiliary mechanical power (24m)
- 42d-1/12 using auxiliary electric power (21c-45 – 21c-47; 74b)
- 42d-1/15 using auxiliary force, photoelectric power (42f-25/02)
- 42d-1/20 Housing and mounting devices for indicating or recording apparatus (21c-24/01; 42f-34/03), safety devices against the unauthorised removal of measuring instruments
- 42d-1/25 Illumination arrangements for indicating and recording devices
- Special design of general-purpose devices for the indication of the instantaneous value of a measured magnitude**
- 42d-2/01 Indicating devices with relative mechanical adjustment of the indicating members: pointers, dials, trailing pointers and other auxiliary pointers (42f-34/13; 83a-12 – 83a-19)
- 42d-2/05 Methods and devices for the manufacture of scales and their calibration for general application, insofar as not included in a special manufacture or calibration class

- 42d-2/10 Indicating devices with optical means: telescopes, projecting devices; also light beam instruments (42h-23; 42h-37; 57a; 42f-34/13)
- 42d-2/20 General-application indicating devices with one common indicating means for several measured magnitudes which can be read simultaneously and independently from one another; coordinate indication of two data from two separate measuring mechanisms; indication of data in several parameters by optical and electro-optical means (optical indication of single data 42d-2/10; multiple-recording instruments 42d-3/10, 42d-3/25. determination of the value of a function of several data 42d-10; indicators 42k-15 – 42k-19; static reading of data by synoptic tables 42n-13/03; oscillographs for electric magnitudes 21e-11)
- 42d-2/50 Devices for the numerical indication of data
- Special designs of general-purpose recording devices for measuring instruments indicating instantaneous values (21e-11/01)**
- 42d-3/01 Devices for continuous recording
- 42d-3/05 Devices for intermittent or otherwise noncontinuous recording
- 42d-3/10 Multiple-recording devices (21e-11/01)
- 42d-3/20 Mechanically operating writing devices: pens (70b-1; 70b-2) ink supply, ink ribbons (15g-37) hole punchers (42p-13; 43a-21; 43a-41), printing devices (15h-5; 43a-13/03; 43a-14)
- 42d-3/25 Photographic recording devices (21e-11; 57a – 57d)
- 42d-3/30 Recording by means of electric sparks, electrolysis, heat, chemical means and the like
- 42d-3/40 Recording surface structures (manufacture of recording papers 55f-16)
- 42d-3/45 Recording surface drives, also datum controlled (83a-1 – 83a-9)
- 42d-3/50 Application of coordinate divisions and of time unit marks to recording surfaces (time-measuring devices 43a-36)

General-purpose measuring instruments with rotary measuring mechanism

- 42d-4/01 Indicating and recording devices (counters 42p; indicating and recording devices for water and gas meters 42e-22/01; electric meters 21e-14 – 21e-22; counters and recording devices in combination with beverage dispensing devices 64c-11; scales with rotary indicators 42f-17)
- 42d-4/10 Rate apparatus in combination with measuring instruments, insofar as not modified by the structure of the meter (rate apparatus in combination with electric meters 21e-17; double-rate gas meters 42e-26/01)
- 42d-5 Generally applicable measuring methods for the determination of physical magnitudes, even if auxiliary electric means are used therefor (methods and devices for measuring electric magnitudes 21e-29 – 21e-36; for chemical laboratory purposes 42i; telemetry 74b; measurement of mechanical oscillations 42c-42)
- 42d-10 Data integrators and devices for the automatic computation of mathematical functions from measured data (42e-23/30; 42i-17/01; 42m-36; 42o-9; 42o-13/01; 42o-15; 21e-22; 21e-29; 21e-35; 21e-36; 74b-8 – 74b-10)

42e Quantity-measuring devices

- 42e-1 Vane-type current meters
- 42e-2 Regulating devices for vane-type current meters
- 42e-3 Hydrostatic-propeller (Woltmann) meters
- 42e-4 Regulating devices for hydrostatic-propeller (Woltmann) meters (means for controlling the flow in pipes 47f-1/01)
- 42e-5 Measures of capacity, measuring cans (64a-4; 64b-17; 64c-10; 64c-30; 64c-43)
- 42e-6 Disk liquid meters
- 42e-7 Rotary meters
- 42e-8 Piston meters with fixed measuring cylinder
- 42e-9 Metering pumps
- 42e-10 Piston meters with moving measuring cylinder

- 42e-11 Combination meters
- 42e-13 Liquid meters with measuring drums rotated by the weight of the liquid
- 42e-14 Quantity measurement derived from the time of flow
- 42e-15 Liquid meters with tilting vessels
- 42e-16 Liquid meters with one measuring vessel (42e-20; 46c2-94; 62c-14; 63h-20; 65f)
- 42e-17 Liquid meters with two measuring vessels and automatic reversal (64c-10; 64c-30; 64c-43)
- 42e-18 Liquid meters with moving partitions, e.g. diaphragms
- 42e-19 Miscellaneous liquid meters
- 42e-20/01 Fuel-consumption meters (determination of the consumption from the fuel level in a container 42e-30 – 42e-36; weighing devices for determining fuel consumption 42f-31/07)
- 42e-20/02 Specific consumption meters, in particular for fuel
- 42e-21 Regulating devices for the inflow and outflow of the liquid
- 42e-22/01 Indicating and recording devices for quantity-measuring devices, insofar as the structure thereof is modified (counting mechanism 42p-9/03)
- 42e-22/02 Testing devices for quantity-measuring devices
- 42e-22/03 Connecting fixtures for quantity-measuring devices
- 42e-22/04 Gas separators for liquid meters
- 42e-22/05 Equipment for the protection of liquid meters against frost
- 42e-22/06 Magnetic couplings in quantity-measuring devices
- 42e-22/07 Miscellaneous details of quantity-measuring devices
- Flow-quantity measuring devices (42o-9; 42o-15)**
- 42e-23/01 Flow meters with obstacles, in particular meters with floats
- 42e-23/05 Flow meters with electrical indication
- 42e-23/10 Thermal flow meters
- 42e-23/15 Measuring orifices for flow meters
- 42e-23/20 Differential pressure gauges for flow meters (42k-8 – 42k-14)
- 42e-23/25 Mechanical indicating and recording devices, in particular for allowing for pressure and temperature
- 42e-23/30 Mechanical integrators for flow meters (42d-4)
- 42e-23/35 Auxiliary and partial-flow meters, devices for proportionating and distributing; quantity measuring according to a predetermined mixture ratio
- 42e-23/40 Flow meters for open channels, weir measurement
- 42e-23/45 Danaides
- 42e-23/50 Miscellaneous flow meters
- 42e-23/55 Quantity-regulating devices
- Gas meters with rotary measuring mechanism**
- 42e-24/01 Wet gas meters with drum and nutating bell
- 42e-24/05 Vane-type gas and steam meters
- Gas meters with control mechanisms and measuring chambers separated by means of movable walls, e.g. diaphragms, bells (42e-18)**
- 42e-25/01 Gas meters with two measuring chambers and trip gear
- 42e-25/05 Gas meters with three or more measuring chambers and continuous tripping
- 42e-25/10 Arrangements of general nature in connection with gas meters with movable walls: diaphragms, diaphragm materials, lubricating devices
- 42e-26/01 Miscellaneous gas meters, arrangements of general nature in connection with gas meters
- Auxiliary devices for gas meters**
- 42e-26/20 Devices for allowing for pressure and temperature
- 42e-26/25 Pressure regulators for gas meters

Other quantity-measuring devices

42e-27 Measuring devices for flowing, powder-like, granular and lump goods (34I-34; 81a-5/01)

42e-28 Malt-measuring devices for grist mills

42e-29 Devices for the determination of the contents of receptacles, volume meters

Supply and level indicators (water-level gauges only for steam boilers 13c-1 – 13c-13; mounting of level indicators on tank vehicles 20c-9, 63a-37; in automobile fuel tanks 63c-78; in motorcycle fuel tanks 63h-20; on aircraft 62c-14/01; in reservoirs and silos 81e-133 – 81e-143; in beverage dispensing devices 64c-12; devices for indicating the presence of water in ships 65a2-43; quantity regulators for liquids 42e-23/55)

42e-30 Supply and level indicators with glass gauges (mounting on steam boilers 13c-1 – 13c-10)

Supply and level indicators with floats (special designs for the float 47f-20; remote indication 74b-1)

42e-31/01 with mechanical indication

42e-31/02 with electrical indication

42e-31/03 with magnetic indication

Supply and level indicators with interposed, stationary media, e.g. air, mercury, diaphragm

42e-32/01 with mechanical indication

42e-32/02 with electrical indication (remote indication 74b-1)

42e-33 Supply and level indicators with compressed or suction air and manometric indication (manometer structures 442k-8 – 42k-14; remote indication 74b-1)

42e-34 Supply and level indicators with electric measuring devices, electrolytic, thermoelectric, photoelectric and the like (quantity-measuring devices with remote indication 74b-1; special design of the measuring instruments 21e)

42e-35 Supply and level indicators with weighing devices (special design structures 42f)

42e-36 Supply and level indicators with stationary or moving plungers, e.g. measuring sticks, paddle wheels (water-level gauges 42c-26/01)

42e-37 Supply and level indicators suited only for granular or powder-like materials

42f Scales and weighing devices (weighing devices combined with packing machines 81a)

42f-1/01 Pendulum scales, general (42f-26/01; 42f-26/02; 42f-29/01; 42f-29/02)

42f-1/02 Cylinder and drum scales

42f-2 Scales with progressively operating, successively or cumulatively introduced weights, rack and chain scales, scales with enlarged weighing range

42f-3 Spring scales (precision spring scales 42f-22)

42f-4 Elevated-pan counter or platform scales (42f-1/01)

42f-5/01 Sliding-weight scales, general

42f-5/02 Sliding weights

42f-6 Sliding-weight scales with automatic shifting of the weight

42f-7 Indicating and printing mechanisms for sliding-weight scales (42f-29/01; 42f-29/02; 42f-32/01; 42f-33)

42f-8 Bridge scales, general, decimal scales, etc.

42f-9 Releasing and stopping devices for bridge scales (for track scales 42f-10)

42f-10 Track scales (42f-13)

42f-11 Approach devices and shock absorbers for track scales

42f-12 Portable weighing devices (42f-13)

42f-13 Single-wheel scales for measuring the wheel pressure of vehicles, e.g. locomotives, automobiles (42f-24)

- 42f-14 Automatic scales for uninterrupted operation with vertically swinging pans
- 42f-15 Automatic scales for uninterrupted operation with tipping pans
- 42f-16 Automatic scales for uninterrupted operation with vertically swinging pans or with a swinging partition in the load pan
- 42f-17 Automatic scales for uninterrupted operation with revolving two-or multi-chamber load pans: drum container
- 42f-18 Automatic weighing devices for filling packages, etc. (81a-5/02)
- 42f-19 Automatic weighing devices for filling sacks (81a-3/01; 81a-3/10)
- 42f-20 Miscellaneous various-purpose automatic weighing devices for uninterrupted operation, exclusive of 42f-14 – 42f-19)
- 42f-21 Details of automatic weighing devices, such as auxiliary devices, weighing of rests, computers, samplers, feed chambers at the receiving end, regulation of the feeding, etc. (42f-14 – 42f-20; 42f-34/01 – 42f-34/50)
- 42f-22 Miscellaneous precision scales (torsion balances 42c-44; spring scales 42f-3)
- 42f-23 Balances for special physical and chemical purposes (42f-22; 42f-31/50; centre-of-gravity balances 42k-32; weighing devices for the determination of the water content and of the density of solid and liquid substances, gas-weighing devices, etc. 42l)
- 42f-24 Hydraulic and pneumatic balances, also ground pressure measuring devices, and determination of the weight of the contents of vessels
- 42f-25/01 Electrical control of the feeding and discharging of the material in the load container
- 42f-25/02 Electrical control of the load equalisation and of the indicating device (42f-6; 42f-7)
- 42f-25/03 Electrical devices for direct load balancing
- 42f-26/01 Letter scales, general (42f-1)
- 42f-26/02 Pocket letter scales, also on writing instruments, etc.
- 42f-27 Weighing devices for hoisting equipment
- 42f-28 Weighing devices for conveying and loading devices, e.g. for conveyor belts, bucket conveyors, ropeways
- 42f-29/01 Price indicating weighing devices, general, e.g. with variable scales
- 42f-29/02 Price indicating weighing devices with computing devices
- 42f-30 Scales for paper, wool, yarn, wire, etc.
- 42f-31/01 Weighing devices for sorting articles according to weight
- 42f-31/02 Weighing devices for counting articles of equal weight
- 42f-31/03 Weighing devices for mixing several substances in a certain ratio
- 42f-31/04 Weighing devices for persons, not coin-operated (coin-operated 43b-45, 43b-46)
- 42f-31/05 Weighing devices combined with portable instruments or tools of any type
- 42f-31/06 Weighing devices combined with stationary containers, furniture, boxes, etc.
- 42f-31/07 Weighing devices for liquids, gases, dough, etc.
- 42f-31/50 Miscellaneous weighing devices for various purposes
- 42f-32/01 Printing mechanisms for weighing devices (for sliding-weight scales 42f-7; for moving loads 42f-33)
- 42f-32/02 Computing, controlling and signalling devices for weighing devices (for sliding-weight scales 42f-7; for moving loads 42f-33; for automatic scales 42f-21)
- 42f-33 Printing mechanisms, computing, controlling and signalling devices combined with weighing devices for moving loads (42f-7; 42f-32/01; 42f-32/02)
- 42f-34/01 Bearings for scales: knife-edges, pans, leaf hinges, magnetic release, ball bearings, etc.
- 42f-34/02 Scale damping devices
- 42f-34/03 Scale housing design
- 42f-34/04 Scale parallel guides
- 42f-34/05 Scale pan design
- 42f-34/06 Scale weights and weight holders (for sliding weights 42f-5/02)
- 42f-34/07 Scale beam design (42f-5 – 42f-7; 42f-22)
- 42f-34/08 Scale zeroing devices

42f-34/09	Scale testing and adjusting devices
42f-34/10	Scale-element disconnection preventers
42f-34/11	Safety arrangements for the transportation of scales
42f-34/12	Lightweight suspensions (42f-22; heavier suspensions 42f-8 – 42f-10)
42f-34/13	Auxiliary and reference scale indicators
42f-34/14	Scale indicating devices (for sliding-weight scales 42f-7)
42f-34/15	Projection scales, also with photographic printing
42f-34/16	Advertising in combination with scales: arrangement of projection and talking apparatus, etc.
42f-34/17	Levelling and blocking devices for tilted scales
42f-34/50	Miscellaneous details of scales

42f (IPC: G01G) Weighing (sorting by weighing 43a5-5/16)

42f-1/00 Weighing apparatus involving the use of a counterweight or other counterbalancing mass

42f-1/02 . Pendulum-weight apparatus

- 42f-1/04 . . the pendulum having a fixed pivot axis
- 42f-1/06 . . . with a plurality of pendulums
- 42f-1/08 . . the pendulum having a moving pivot axis, e.g. a floating pendulum
- 42f-1/10 . . . with a plurality of pendulums
- 42f-1/12 . . Constructional arrangements for obtaining equal indicative divisions
- 42f-1/14 . . Temperature-compensating arrangements
- 42f-1/16 . . Means for correcting for obliquity of mounting
- 42f-1/18 . . Balances involving the use of a pivoted beam, i.e. beam balances
- 42f-1/20 . . Beam balances having the pans carried below the beam, and for use with separate counterweights
 - 42f-1/22 . . . for precision weighing
 - 42f-1/24 . . Platform-type scales, i.e. having the pans carried above the beam
 - 42f-1/26 . . with associated counterweight or set of counterweights
 - 42f-1/28 . . . involving means for automatically lifting counterweights corresponding to the load
 - 42f-1/30 . . . wherein the counterweight is in the form of a chain
 - 42f-1/32 . . . wherein the counterweights are in the form of rider-weights
 - 42f-1/34 . . . involving a fixed counterweight, with poise-weights selectively added to the load side
 - 42f-1/36 . . . wherein the counterweights are slidable along the beam, e.g. steelyards
 - 42f-1/38 with automatically-driven counterweight
 - 42f-1/40 . . specially adapted for weighing by substitution
 - 42f-1/42 . . Temperature-compensating arrangements

42f-3/00 Weighing apparatus characterised by the use of elastically-deformable members, e.g. spring balances

- 42f-3/02 . wherein the weighing element is in the form of a helical spring
- 42f-3/04 . . using a plurality of springs
- 42f-3/06 . wherein the weighing element is in the form of a spiral spring
- 42f-3/08 . wherein the weighing element is in the form of a leaf spring
- 42f-3/10 . wherein the torsional deformation of a weighing element is measured
- 42f-3/12 . wherein the weighing element is in the form of a solid body stressed by pressure or tension during weighing
 - 42f-3/14 . . measuring variations of electrical resistance
 - 42f-3/15 . . measuring variations of magnetic properties
 - 42f-3/16 . . measuring variations of frequency of oscillations of the body
 - 42f-3/18 . Temperature-compensating arrangements

42f-5/00 Weighing apparatus wherein the balancing is effected by fluid action

- 42f-5/02 . with a float or other member variably immersed in liquid
- 42f-5/04 . with means for measuring the pressure imposed by the load on a liquid (pressure gauges per se 42k)

42f-7/00	Weighing apparatus wherein the balancing is effected by magnetic, electromagnetic, or electrostatic action, or by means not provided for in the preceding groups
42f-7/02	. by electromagnetic action
42f-7/04	. . with means for regulating the current to solenoids
42f-7/06	. by electrostatic action
42f-9/00	Methods of, or apparatus for, the determination of weight not otherwise provided for
42f-11/00	Apparatus for weighing a continuous stream of material during flow; Conveyor-belt weighers
42f-11/02	. having mechanical weight-sensitive devices
42f-11/04	. having electrical weight-sensitive devices
42f-11/06	. having fluid weight-sensitive devices
42f-11/08	. having means for controlling the rate of feed or discharge (regulation of flow of fluent material 42r2)
42f-11/10	. . by controlling the height of the material on the belt
42f-11/12	. . by controlling the speed of the belt
42f-11/14	. using totalising or integrating devices (totalising or integrating devices per se 42m)
42f-13/00	Weighing apparatus with automatic feed or discharge for weighing-out batches of material (for weighing a continuous stream 42f-11/00; check-weighing 42f-15/00; for liquids 42f-17/04; for apportioning by weight materials to be mixed 42f-19/22)
42f-13/02	. Means for automatically loading weigh-pans or other receptacles, e.g. disposable containers, under control of the weighing mechanism
42f-13/04	. . involving dribble-feed means controlled by the weighing mechanism to top up the receptacle to the target weight
42f-13/06	. . . wherein the main feed is effected by gravity from a hopper or chute
42f-13/08	. . . wherein the main feed is effected by mechanical conveying means, e.g. by belt conveyers, by vibratory conveyers
42f-13/10	. . . wherein the main feed is effected by pneumatic conveying means, e.g. by fluidised feed of granular material
42f-13/12	. . Arrangements for compensating for material suspended at cut-off, i.e. for material which is still falling from the feeder when the weigher stops the feeder
42f-13/14	. . Arrangements for determination of, or compensation for, the tare weight of an unloaded container, e.g. of a disposable container
42f-13/16	. Means for automatically discharging weigh receptacles under control of the weighing mechanism
42f-13/18	. . by valves or flaps in the container bottom
42f-13/20	. . by screw conveyers in the weigh receptacle
42f-13/22	. . by tilting or rotating the receptacle
42f-13/24	. Weighing mechanism control arrangements for automatic feed or discharge
42f-13/26	. . involving fluid-pressure systems
42f-13/28	. . involving variation of an electrical variable which is used to control loading or discharge of the receptacle
42f-13/30	. . involving limit switches or position-sensing switches
42f-13/32	. . . involving photoelectric devices
42f-13/34	. . involving mechanical linkage motivated by the weighing mechanism
42f-15/00	Arrangements for check-weighing of materials dispensed into removable containers (packaging aspects 81a)
42f-15/02	. with provision for adding or removing a make-up quantity of material to obtain the desired net weight (dribble-feed means for automatic batch-weighers 42f-13/04)
42f-15/04	. with provision for adding or removing a make-up quantity of material to obtain the desired gross weight (dribble-feed means for automatic batch-weighers 42f-13/04)
42f-17/00	Apparatus for, or methods of, weighing material of special form or property (determining weight by measuring volume 42e)
42f-17/02	. for weighing material of filamentary or sheet form

42f-17/04	. for weighing fluids, e.g. gases, pastes
42f-17/06	. . having means for controlling the supply or discharge
42f-17/08	. for weighing livestock
42f-19/00	Weighing apparatus or methods adapted for special purposes not provided for in the preceding groups
42f-19/02	. for weighing wheeled or rolling bodies, e.g. vehicles
42f-19/04	. . for weighing railway vehicles
42f-19/06	. . . on overhead rails
42f-19/07	. . for weighing aircraft
42f-19/08	. for incorporation in vehicles (arrangements on vehicles 63c, 20c)
42f-19/10	. . having fluid weight-sensitive devices
42f-19/12	. . having electrical weight-sensitive devices
42f-19/14	. for weighing suspended loads (42f-3/00 takes precedence; incorporation of weighing devices in cranes 35b-1/40, 35b-13/16)
42f-19/16	. . having fluid weight-sensitive devices
42f-19/18	. . having electrical weight-sensitive devices
42f-19/20	. . for weighing unbalanced loads
42f-19/22	. for apportioning materials by weighing prior to mixing them (ratio regulation 42r2-11/00)
42f-19/24	. . using a single weighing apparatus
42f-19/26	. . . associated with two or more counterweighted beams
42f-19/28	. . . having fluid weight-sensitive devices
42f-19/30	. . . having electrical weight-sensitive devices
42f-19/32	. . using two or more weighing apparatus
42f-19/34	. . with electrical control means
42f-19/36	. . with mechanical control means
42f-19/38	. . programme controlled, e.g. by perforated tape (programme control in general 42r1-19/00)
42f-19/40	. with provisions for indicating, recording, or computing price or other quantities dependent on the weight (indicating means for weighing apparatus 42f-23/18; recording means for weighing apparatus 42f-23/18; computers in general 42m)
42f-19/41	. . using mechanical computing means
42f-19/413	. . using electromechanical or electronic computing means
42f-19/417	. . with provision for checking computing part of balance
42f-19/42	. . for counting by weighing
42f-19/44	. for weighing persons
42f-19/46	. . Spring balances specially adapted for this purpose
42f-19/48	. . Pendulum balances specially adapted for this purpose
42f-19/50	. . having additional measuring devices, e.g. for height
42f-19/52	. Weighing apparatus combined with other objects, e.g. with furniture (with walking-sticks 33a-13/01)
42f-19/54	. . combined with writing implements or paper-knives
42f-19/56	. . combined with handles of tools or of household implements
42f-19/58	. . combined with handles of suit-cases or trunks
42f-19/60	. . combined with fishing equipment, e.g. with fishing rods
42f-21/00	Details of weighing apparatus
42f-21/02	. Arrangements of bearings (bearings per se 47b)
42f-21/04	. . of knife-edge bearings
42f-21/06	. . of ball or roller bearings
42f-21/08	. . Bearing mountings or adjusting means therefor
42f-21/10	. . Floating suspensions; Arrangements of shock-absorbers (shock-absorbers per se 47a3)
42f-21/12	. . Devices for preventing derangement
42f-21/14	. Beams
42f-21/16	. . of composite construction; Connections between different beams
42f-21/18	. Link connections between the beam and the weigh pan
42f-21/20	. . for precision weighing apparatus
42f-21/22	. Weigh-pans or other weighing receptacles; Weighing platforms
42f-21/24	. Guides or linkages for ensuring parallel motion of the weigh-pans

42f-21/26	. Counterweights; Poise-weights; Sets of weights; Holders for the reception of weights
42f-21/28	. Frames; Housings
42f-21/30	. Means for preventing contamination by dust
42f-23/00	Auxiliary devices for weighing apparatus
42f-23/02	. Relieving mechanisms; Arrestment mechanisms
42f-23/04	. . for precision weighing apparatus
42f-23/06	. Means for damping oscillations, e.g. of weigh-beams
42f-23/08	. . by fluid means
42f-23/10	. . by electric or magnetic means
42f-23/12	. . specially adapted for preventing oscillations due to movement of the load
42f-23/14	. Devices for determining tare weight or for cancelling out the tare by zeroising, e.g. mechanically operated (in connection with automatic loading 42f-13/14)
42f-23/16	. . electrically or magnetically operated
42f-23/18	. Indicating devices, e.g. for remote indication; Recording devices; Scales, e.g. graduated (indicating or recording devices in general 42d)
42f-23/20	. . Indicating the weight by mechanical means
42f-23/22	. . . combined with price indicators
42f-23/24	. . . involving logarithmic scales
42f-23/26	. . . Drive for the indicating member, e.g. mechanical amplifiers
42f-23/28	. . . involving auxiliary or memory marks
42f-23/30	. . . with means for illuminating the scale
42f-23/32	. . Indicating the weight by optical projection means
42f-23/34	. . . combined with price indicators
42f-23/35	. . indicating the weight by photographic recording
42f-23/36	. . indicating the weight by electrical means, e.g. using photoelectric cells
42f-23/365	. . . involving comparison with a reference value
42f-23/37	. . . involving digital counting
42f-23/38	. . Recording or coding devices specially adapted for weighing apparatus (computers per se 42m; disc converters in general 74b)
42f-23/40	. . . mechanically operated
42f-23/42	. . . electrically operated

42g Acoustics, especially sound recording and reproduction

Miscellaneous acoustic devices (sound reproduction in telephony and radio broadcasting 21a2; sound damping in building engineering 37a-7, 37b-6, 37f-1/02; in phonographs 42g-6/08; in exhaust devices 6c6-1 – 46c6-3; between stationary machines and foundations 47a-20; ultrasound generators 42s; direct sound generators for musical instruments 51a – 51f; sound reproduction for signalling devices 74d; for dolls 77f-6, 77f-3/30 – 77f-3/34)

42g-1/01	Sound analysis, the measuring of the pitch and intensity of sound, etc.; frequency records (direction and distance measurement by means of sound 74d-6/12 – 74d-6/16)
42g-1/02	Automatic recording of spoken sounds in written characters (telegraphic operation of typewriters 21a1-16)
42g-1/03	Apparatus for monitoring mechanical oscillations, especially for seismological research and machine testing (measuring of mechanical oscillations 42c-42; stethoscopes 30a-5; hearing aids for deaf persons 21a2-17, 30d-28; monitoring devices for direction and distance measurements by means of sound 74d-6; monitoring microphones 21a2-16/01)
42g-1/04	Mechanical sound amplification (sound horns 42g-6/02 – 42g-6/08; electrical amplifiers 21a2-18, 21a2-41; electric loudspeakers 21a2-14/01 – 21a2-14/04), resonators, miscellaneous
42g-1/10	Methods, devices and materials for soundproofing and sound damping, general

Sound boxes, means for recording and reproducing sounds, sound conductors (information storage 42t1)

- 42g-2/01 Form and material of recording and reproducing styluses and needles (manufacture of needles 7e-1 – 7e-7; needle-sharpening devices 67a-31/10)
- 42g-2/02 Mounting of styluses or needles on stylus or needle holders, including intermediate devices
- 42g-2/03 Multiple stylus arrangement on the stylus holder and needle-changing devices
- 42g-2/04 Stylus or needle holders and mounting thereof in sound boxes
- 42g-2/05 Stylus holder connections to diaphragms (sound levers), and sound control devices mounted thereon
- 42g-3/01 Sound-box diaphragms, form and building material (for electrical apparatus, microphones, loudspeakers and the like 21a2-11 – 21a2-13)
- 42g-3/02 Diaphragm mountings in sound boxes
- 42g-3/03 Large diaphragms or direct acoustic radiating devices for phonographs, forms, materials and mounting (for electric loudspeakers 21a2-11 – 21a2-13)
- 42g-4/01 Acoustic sound boxes, form and material
- 42g-4/02 Mounting of sound boxes in pickup arms
- 42g-4/03 Multiple-diaphragm sound boxes
- 42g-4/04 Sound regulation in sound boxes
- 42g-4/05 Pneumatic sound boxes
- 42g-4/06 Guiding arms for sound boxes with movable sound horn, mounting and guiding of electrical pickups in phonographs
- 42g-5/01 Electromagnetic sound recorders and reproducers for phonographs
- 42g-5/02 Microphone pickups, electrodynamic, electrostatic, piezoelectric and other electric recording and reproducing devices for phonographs (sound recorders and reproducers of other types 42g-8 – 42g-11)
- 42g-6/01 Pickup arms: material, design, mounting onto phonographs; pickup-arm branch connections
- 42g-6/02 Sound horns: material, form and manufacture (for electric loudspeakers 21a2-14/01 – 21a2-14/04, 21a2-15/01)
- 42g-6/03 Built-in sound conductors and horns
- 42g-6/04 Collapsible sound horns
- 42g-6/05 Sound reflectors
- 42g-6/06 Sound distribution; hearing and speaking tubes, sound-horn division, multiple sound horns (pickup-arm branch connections 42g-6/01)
- 42g-6/07 Tone improvement in sound horns, building-in of resonating bodies or the like
- 42g-6/08 Regulation of the sound intensity, building-in of damping and regulating devices into sound conductors and the like (in sound levers 42g-2/05; in sound boxes 442g-4/04)
- Methods of sound recording and sound reproduction from sound tracks (in conjunction with picture recording 57a)
- 42g-7/01 Recording studio and sound receiver structures for sound recordings and the like (microphones in general 21a2-1 – 21a2-17)
- 42g-7/02 Electrical amplifying devices, insofar as especially designed for sound recording and reproduction (amplifiers in general 21a2-18, 21a2-41, 21a4-29/06)
- 42g-7/03 Special equipment for needle sound recording (sound recorder drives 42g-21/05)
- Sound-intensity regulation, distortion and correction in electrical and electrooptical sound recording and reproduction devices (in conjunction with picture recording 57a-71/02)
- 42g-8/01 Electrical regulation (general 21a2-18/07, 21a2-41/06)
- 42g-8/02 Optical regulation
- 42g-8/03 Electrical change-over
- 42g-8/04 Optical change-over (for pictures 57a-61)
- 42g-8/05 Electrical distortion and correcting (general 21a2-36/13)

- 42g-8/06 Optical distortion and correction
- 42g-8/07 Control devices
- 42g-8/08 Production of reverberation and directional effects (stereo-acoustics) in sound recording and reproduction; equipment for this purpose (when purely electrical 21a2-16/03)
- Optical sound recording and reproduction means
- 42g-9/01 Adjustable luminosity lamps for sound recording (electric lamps in general 21f; cathode-ray tubes 21a1-32/35, 21a1-32/54; 21g-13/21 – 21g-13/29)
- 42g-9/02 Screen and mirror arrangements for sound recording
- 42g-9/03 Light slots for sound recording or reproduction
- 42g-9/04 Optical devices for the sound recording or reproduction
- 42g-9/05 Photocells for reading sound tracks (general 21g-29)
- 42g-9/06 Lamps for reading sound tracks
- Sound recording by magnetising metals, and reproduction means (general 21g)
- 42g-10/01 Recording heads, magnetising sound recorders and the appertaining reproducers
- 42g-10/02 Magnetic recording media
- Electrical resistance recording and related reproducing means
- 42g-11/01 Electrolytic devices
- 42g-11/02 Capacitance, dielectric and ohmic devices
- 42g-12 Record finishing, especially on tapes, e.g. cutting, sound-track base bonding (in conjunction with picture recording 57a-71)
- Transformation and duplication of sound tracks (in conjunction with picture recording 57a-71)
- 42g-13/01 Optical and electrooptical transfer means (optical copying, general, 57a-5/04; contact-copying, general, 57c-11)
- 42g-13/02 Mechanical, electromechanical and electrical transfer means
- Media for mechanical recording and duplication**
- Mechanical section
- 42g-14/01 Phonograph discs: lead-in and lead-out grooves, guiding grooves, normal sound recording, labels and special-purpose structures, e.g. for phonograph record mail, phonographic picture post cards
- 42g-14/02 Design of sound cylinders, sound cones and the like, and sound-recording media of special form
- Chemical section
- 42g-15/01 Sound-track media made of shellac, gelatine, metal and the like (plastic materials from natural resin, gelatine, etc., in general 39b-16 – 39b-21, 39b-24 – 39b-26)
- 42g-15/02 Sound-track media made of cellulose derivatives (celluloid-type materials in general 39b, 12-15)
- 42g-15/03 Sound-track media made of synthetic resins (synthetic resins in general, 39b-12 – 39b-15)
- 42g-15/04 Sound-track media made of wax-like materials (wax-like materials in general 39b-23)
- 42g-16/01 Structure and manufacture of matrices for phonographic discs (imparting conductivity to non-metallic objects in general 48a-2, 48a-5/64)
- 42g-16/02 Mould pressing and casting
- 42g-16/03 Presses for phonographic discs (processing of plastic materials in general, 39a)
- Driving mechanisms for sound recording and reproducing devices**
- 42g-17/01 Spring mechanisms for phonographs (clock movements 83a-1 – 83a-11; spring mechanisms in general 46e)
- 42g-17/02 Spring mechanism drive elements: winding cranks, prevention of the over-winding of the driving spring, lubrication devices for phonographs

- 42g-17/03 Hand, weight, hydraulic or the like, driving mechanisms
- 42g-17/04 Special structures of electric motors for phonographs (electric motors, general 21d1-17 – 21d1-23, 21d1-45 – 21d1-47; 21d2-16 – 21d2-21; 21e-15)
- 42g-17/05 Intermediate gears for electrically driven phonographs, starter devices and the like
- 42g-17/06 Spring winding by means of an electric motor, alternative spring-mechanism or electric-motor drive (in clocks 83b-7/10)
- 42g-17/07 Mounting, acoustical and electrical insulation of the driving mechanism
- 42g-18 Driving mechanisms for tape-and wire-recording media (in general 42t1-15; sound film drive 57a-69)
- 42g-19/01 Centrifugal governors for phonographs (centrifugal governors in general 60), brake regulators and adjusting devices therefor (devices providing a variable disc rotation speed or a constant travel speed 42g-21/04)
- 42g-19/02 Regulation of the number of revolutions by controlling the current circuit in electrically driven phonographs (21c-59)
- 42g-19/03 Regulation of the number of revolutions by means of gearshifts or friction gears (47h-12 – 47h-14)
- Multiple and magazine phonographs**
- 42g-20/01 with two or more alternately operating units for playing several phonograph discs without interruption (change-over devices for electrical pickups 42g-8/03 – 42g-8/04)
- 42g-20/02 with several turntables or cylinder holders operating consecutively
- 42g-20/03 for successively playing several phonographic discs, using disc magazines or stacks and record changers
- 42g-20/04 for selective sound record playing (juke boxes 43b, 39)
- 42g-20/05 for simultaneous playing several sound recordings
- Special arrangements for phonographs**
- 42g-21/01 Turntables and their mounting; collapsible record holders for use with phonographs
- 42g-21/02 Repeating devices (42g-20/03 – 42g-20/04)
- 42g-21/03 Stopping and starting devices, mechanical and electrical (starter for motors 42g-17/05)
- 42g-21/04 Devices for obtaining uniform tangential velocity
- 42g-21/05 Gears for driving the sound box or the turntable, especially in sound recording (phonograph disks with guiding grooves 42g-14/01)
- 42g-21/06 Devices for the indication of specific points in the sound recording
- 42g-22/01 Cylinder holders and rejecters
- 42g-22/02 Devices for engaging and disengaging the driving mechanism (special devices for connection to telephones 21a2-31 – 21a2-32)
- 42g-22/03 Pickup guiding and shifting devices
- 42g-22/04 Pickup returning devices
- 42g-22/05 Marking and signalling devices
- 42g-22/06 Lathes and polishing devices for recording cylinders
- Phonographs combined with other devices** (with motion-picture projectors 57a-64 – 57a-72; with advertising 54h-1/04; alarm devices with phonographs 74a-21/13)
- 42g-23 Disc phonographs and the like combined with cylinder phonographs, tape or wire recorders, etc.
- 42g-24/01 Phonographs combined with musical instruments, sound generators or mechanical musical instruments (keyboard phonographs 51f-1)
- 42g-24/02 Phonographs combined with radiotelephones (electric circuits therefor 21a4-29/06, 21a4-75)
- 42g-24/03 Phonograph structures containing loudspeakers (loudspeaker structures 21a2)
- 42g-25/01 Phonographs built in furniture and lamps (phonograph consoles and casings 42g-26/01)
- 42g-25/02 Phonographs combined with dolls, toys or the like

Housing containers and accessories

- 42g-26/01 Phonograph housings: consoles, casings, cover housings and the like
- 42g-26/02 Small and portable talking machines, also with folding pickup arm, sound-conduction system built in suitcase, needle and record containers in portable phonographs and the like (suitcases in general 33b)
- 42g-26/03 Cover supports for phonographs (cover supports in general 33b-15/04)
- 42g-27/01 Record envelopes and albums (11e)
- 42g-27/02 Record cases, cabinets, and other containers
- 42g-27/03 Protecting devices of other kinds for sound discs or sound cylinders, seals and the like
- 42g-28/01 Containers for needles (in portable instruments 42g-26/02)
- 42g-28/02 Containers for other phonograph parts, cylinders, horns, etc.
- 42g-29 Phonograph illumination
- 42g-30 Disc-cleaning devices (on needle containers 42g-28/01)

42h Optics, including microtomes, photometers and colorimeters (searchlights in general 4b; for electric lighting 21f; opto-electronic image-forming devices 21g-37/20)**Optical lenses and lens systems**

- 42h-1/01 Single optical lenses, utilisation of special manufacturing material for this purpose (production of variable reflection coatings on glass 32b-6/50)
- 42h-1/02 Single lenses with aspherical surfaces
- 42h-1/03 Liquid lenses
- 42h-2 Eyepieces
- 42h-3/01 Telescope and microscope objectives (magnifying glasses 42h-34)
- 42h-3/02 Lens and mirror condensers for microscopes for observation in transmitted light
- 42h-3/03 Lens and mirror condensers for microscopes for observation in incident light

Photographic objectives

- 42h-4/01 two-component, symmetric
- 42h-4/02 two-component, asymmetric
- 42h-4/03 three-component, with non-cemented members
- 42h-4/04 three-component, with cemented members
- 42h-4/05 four-component, with non-cemented members
- 42h-4/06 four-component, with cemented members
- 42h-4/07 five and more components, with non-cemented members
- 42h-4/08 five and more components, with cemented members
- 42h-4/09 Objectives of the Petzval type
- 42h-4/10 Teleobjectives
- 42h-4/11 Objectives with bent optical axis
- 42h-4/12 Mirror objectives
- 42h-4/13 Objectives providing artistic soft-image effects
- 42h-4/20 Objectives of special construction
- 42h-5 Optical systems compensating for image aberration (57a-34/01, 57a-34/02)
- 42h-6/01 Systems for multicolour projection (42h-23/13)
- 42h-6/02 Systems with variable focal lengths
- 42h-6/03 Anamorphic systems
- 42h-6/04 Systems for the projection of lenticular films
- 42h-6/10 Systems for other purposes, e.g. projection objectives and view-finder systems

Prisms and mirrors for optical purposes

- 42h-7 Prisms for optical purposes (42c-17/20; 42h-12)
- 42h-8 Mirrors for optical purposes (mirror coating 32b-10, 32b-17/12, 42h-4/12, 42h-10/12, 42h-23/02, 42h-32/04)

42h-9 Fine optical systems for searchlights (4b; 21f-10; 21f-21; 21f-38; 21f-61/03; 42h-23/02; 74d-8 – 74d-10)

Telescopes and accessories

42h-10/01 General optical structure of conventional simple terrestrial telescopes
 42h-10/02 General optical and mechanical structure of submarine periscopes
 42h-10/03 Astronomical telescopes, mechanical section (optical section 42h-2, 42h-3/01, 42h-8)
 42h-10/04 Ordinary finder telescopes
 42h-10/05 Finder telescopes with prisms or mirrors
 42h-10/06 Sights for finder telescopes, also illuminated (72f-3)
 42h-10/07 Finder devices of simple design: collimators and the like
 42h-10/08 Finder telescopes for searchlights
 42h-10/09 Finder telescopes for aircraft, optical section (72f-12/05; 72f-12/06)
 42h-10/10 Panoramic telescopes
 42h-10/11 Extensible (mast) telescopes
 42h-10/12 Ordinary single telescopes with lenses and mirrors
 42h-10/13 Single telescopes with photographic arrangements
 42h-10/14 Single telescopes with several oculars for several observers
 42h-10/15 Structural combination of more than two single telescopes
 42h-10/16 Single telescopes for use under water
 42h-10/17 Protecting devices for single telescopes
 42h-10/18 Folding single telescopes
 42h-10/19 Sharp-focusing means for single telescopes

Galilean and other lens-type double telescopes (optical systems, also 42h-2, 42h-3)

42h-11/01 General optical structure
 42h-11/02 Mechanical structure
 42h-11/03 Folding
 42h-11/04 Devices for adjusting the sharpness of the image
 42h-11/05 Devices for adjusting the eye distance
 42h-11/06 with auxiliary and accessory attachments: mirrors, compasses, bubble levels, acoustic tubes and the like
 42h-11/07 Holding and carrying devices, also with lens protection (42h-31/05)

Prism-type double telescopes (42h-2; 42h-3; 42h-7)

42h-12/01 General optical structure
 42h-12/02 Mechanical structure
 42h-12/03 Devices for adjusting the sharpness of the image
 42h-12/04 Devices for adjusting the eye distance
 42h-12/05 with great objective distance, e.g. scissor telescopes
 42h-12/06 Devices for adjusting prism systems

Telescopes with variable magnification (42h-2; 42h-3/01)

42h-13/01 Variation due to objective substitution
 42h-13/02 Variation due to eyepiece substitution
 42h-13/03 Variation due to reversing system substitution or other modification
 42h-13/04 Variation due to special interposed lenses

Microscopes and accessories, also microtomes (magnifying glasses 42h-34/01, 42h-34/02)

42h-14/01 General mechanical structure
 42h-14/02 Binocular microscopes
 42h-14/03 Devices for the fine adjustment of the image sharpness
 42h-14/04 Objective and eyepiece changers

- 42h-14/05 Illuminating devices, excluding lens and mirror condensers as specified in 42h-3/02, 42h-3/03
- 42h-15/01 Microscope clips
- 42h-15/02 Stages including mechanical stages and the like, specimen holders and slides, miscellaneous auxiliary equipment
- 42h-15/03 Heating and cooling devices for microscopes, when not combined with a microtome
- 42h-16/01 Microtomes
- 42h-16/02 Freezing stages for microtomes
- Photometers, colorimeters, also exposure meters and light-distribution meters**
- 42h-17/01 Photometers in general
- 42h-17/02 Photometers with photosensitive cells
- 42h-17/03 Photometers of simple construction for photographic purposes
- 42h-17/04 Flicker photometers
- 42h-17/05 Brightness photometers
- 42h-17/06 Turbidimeters
- 42h-18/01 Colorimeters in general
- 42h-18/02 Colorimeters with photosensitive cells
- 42h-19 Illumination meters for working places and the like
- 42h-20/01 Common spectroscopes; monochromators
- 42h-20/02 X-ray spectrometers, and electronic spectrometers, insofar as mechanical structure is considered
- 42h-21 Polarimeters, also saccharimeters
- Monocular and binocular viewing devices**
- 42h-22/01 Viewing devices for single pictures
- 42h-22/02 Stereoscopes with lenses
- 42h-22/03 Stereoscopes with prisms or mirrors
- 42h-22/04 General mechanical stereoscope structures
- 42h-22/05 Stereoscopes with films and other picture strips
- 42h-22/06 Stereoscopes with picture stacks
- 42h-22/07 Stereoscopes with picture drums
- 42h-22/08 Stereoscopes with special picture holders
- 42h-22/09 Stereoscopes with picture-illuminating devices, coloured glass and the like
- 42h-22/10 Collapsible stereoscopes
- Projectors and accessories for still photographs (motion-picture projectors 57a-33 – 57a-61; advertisement projectors 54h-3; section projectors 42b-26/03)**
- 42h-23/01 Illumination lenses and lens systems
- 42h-23/02 Illumination mirrors
- 42h-23/03 Illumination systems consisting of lenses and mirrors
- 42h-23/04 Light sources
- 42h-23/05 Projectors with film-like picture strips
- 42h-23/06 Projectors with picture strips, exclusive of films
- 42h-23/07 Projectors with picture stacks
- 42h-23/08 Projectors with picture drums
- 42h-23/09 Projectors with disk-like picture holders
- 42h-23/10 Episcopes type projectors
- 42h-23/11 Epidiascope-type projectors
- 42h-23/12 Projectors, console and cabinet-type, collapsible, and projectors in which the path of the rays is bent by means of mirrors or the like
- 42h-23/13 Projectors for several colours (42h-6/01)

- 42h-23/14 Projectors for stereoscopic projection, also stereoscopic X-ray projection
- 42h-23/15 Projectors with devices for heightening the relief effect
- 42h-23/16 Projectors with mirrors between the screen and the eye of the observer
- 42h-23/17 Projectors, multiple, alternate single or combined projection, also projectors in circular arrangements
- 42h-23/18 Projectors for star projection (planetarium projectors)
- 42h-23/20 Projectors for the projection of aerial pictures
- 42h-23/21 Projectors of simple structure
- 42h-23/22 Picture changers
- 42h-23/23 Special picture holder structures
- 42h-23/24 Cooling devices
- 42h-23/25 Condenser sockets
- 42h-23/26 Projectors and equipment of the particular type in question, e.g. projection of written signs or the like while they are being formed, photosensitive recorders
- 42h-23/27 Plane screens
- 42h-23/28 Curved screens
- 42h-23/29 Supporting devices for picture screens
- 42h-24 Kaleidoscopes and projectors for the production of patterns
- 42h-25 Magic lanterns (42h-23)

Spectacles and pince-nez

- 42h-26/01 Ordinary spectacles, also with cylindrical, toroidal or aspherical surfaces
- 42h-26/02 Spectacles with multifocal lenses
- 42h-26/03 Contact lenses
- 42h-27 Mounting of lenses in rimless spectacles and pince-nez, especially lens-holder structures
- 42h-28/01 Spectacles and pince-nez with adjustable lenses, also reversible spectacles
- 42h-28/02 Spectacles and pince-nez with adjustable bridges, also with replaceable bridges
- 42h-29/01 Lens fastenings in rimmed spectacles and pince-nez
- 42h-29/02 Frames for spectacles, in general
- 42h-29/03 Bridges for spectacles
- 42h-29/04 Nose grips for spectacles
- 42h-29/05 Pads for bridges of spectacles
- 42h-29/06 Bows for spectacles
- 42h-29/07 Adjustable bows for spectacles
- 42h-29/08 Collapsible bows for spectacles
- 42h-29/09 Removable bows for spectacles
- 42h-29/10 Closure blocks for spectacle frames
- 42h-29/11 Finger pince-nez
- 42h-29/12 Bar pince-nez
- 42h-29/13 Spring pince-nez
- 42h-29/14 Clips and bridges for pince-nez
- 42h-29/15 Adjustable clips
- 42h-29/16 Pince-nez with upright or inclined springs
- 42h-29/17 Pince-nez with integral bridge and holder
- 42h-29/30 Miscellaneous spectacles and pince-nez
- 42h-30/01 Monocles
- 42h-30/02 Lorgnettes
- 42h-31/01 Spectacles and pince-nez with mirrors for rearward or lateral vision
- 42h-31/02 Spectacles and pince-nez with lighting devices
- 42h-31/03 Clip-on or superposed glasses for spectacles and pince-nez
- 42h-31/04 Stenopaic spectacles and spectacles for shooting

- 42h-31/05 Telescopic spectacles (42h-11/07)
- 42h-31/06 Antiglare devices for spectacles (30d-27/01)
- 42h-31/07 Devices for the fastening of the spectacles to headgear and the like (41c-6)
- 42h-31/08 Devices preventing mist formation on spectacles (61a-29/13)
- 42h-31/09 Devices for fitting spectacle frames
- 42h-31/10 Collapsible spectacle frames
- 42h-31/20 Devices of special nature mounted on or related to spectacles and pince-nez
- Apparatus for eye examination (30a-3)**
- 42h-32/01 Eye refractometers, optometers, keratometers, pupillometers, and the like
- 42h-32/02 Hand ophthalmoscopes without lighting devices
- 42h-32/03 Hand ophthalmoscopes with lighting devices
- 42h-32/04 Ophthalmoscopes of simple construction
- 42h-32/05 Perimeters
- 42h-32/06 Trial frames and the like
- 42h-32/07 Apparatus for the photography of the fundus
- 42h-34/01 Magnifying glasses
- 42h-34/02 Magnifying glasses with lighting devices
- 42h-34/03 Optical reading devices, reading glasses
- 42h-34/04 Optical devices for fluorescence analysis
- 42h-34/05 Optical devices for testing pearls and precious stones
- 42h-34/06 Optical devices for the automatic sorting of objects according to colour or brightness (42h-18/02; 45e-21/31; 79b-9; 79b-13/01; 81a-14)
- 42h-34/07 Optical thread counters for fabrics
- 42h-34/08 Optical filters for increasing the visibility of objects (filters for artificial daylight 4b-15/04)
- 42h-34/09 General structure of lens holders
- 42h-34/10 Tube and plate diaphragms for optical purposes
- 42h-34/11 Interferometers (42b-8/02; 42b-12/05; 42h-20/01)
- 42h-34/12 Optical endoscopes for industrial purposes
- 42h-34/13 Miscellaneous optical adjusting devices
- 42h-35/01 Devices for the measurement of optical defects and constants of optical elements
- 42h-35/02 Axometers and axonometers
- 42h-35/03 Spherometers
- 42h-36 Refractometers for industrial purposes (eye refractometers 42h-32/01)
- 42h-37 Stroboscopes as optical observation devices (42o-13/02; 57a-36)
- 42h-38 General methods and devices for the physical-optical image production, e.g. X-ray microscopy, microradiography, optical image production on the basis of theoretical refraction principles (structure of the image-forming system from the geometrical-optical point of view 42h-1 – 42h-9; microscopy accessories 42h-14 – 42h-16; electron microscope 21g-37/01; electron-optical elements 21g-37/20; image converters 21g-29; electrical picture transmission 21a1-32)

42i Thermometers: air, liquid and metal thermometers, electric thermometers; optical pyrometers; thermostatically controlled cabinets, water baths; measurement of heat conductivity, expansion, transfer and transmission coefficients of fusion and boiling points; calorimeters; heat measuring devices, e.g. heat-quantity meters for central-heating installations; humidity meters [hygrometers], meteorological instruments (valve structures 47g; automatic condition regulators for general utilisation 42q, 42r)

Thermometers [heat measuring devices] operating by the expansion of liquid materials

- 42i-1/01 Special expanding liquids
- 42i-1/02 Beckmann thermometers
- 42i-1/03 Special designs and materials of the liquid reservoir, also for surface thermometers
- 42i-1/04 Scale and capillary fastenings
- 42i-1/05 Optical structure of the capillary
- 42i-1/06 Thermometer manufacturing methods, including scale marking
- 42i-1/07 Scale illumination
- 42i-1/08 Mounting of scale-reading magnifying glasses and the like
- 42i-1/10 Clinical thermometers, also with maximum devices
- 42i-1/11 Containers for clinical thermometers (disinfecting covers for clinical thermometers 30a-19/01)
- 42i-1/12 Centrifugal devices for clinical thermometers and other devices for returning the mercury
- 42i-1/20 Stands and holders for liquid thermometers (for veterinary purposes 30c-7/04)
- 42i-1/21 Fixed protecting housings for thermometers in pipes
- 42i-1/30 Liquid thermometers with recording devices, also photographic recording (remote indicating devices for liquid thermometers 74b)
- 42i-1/31 Liquid contact thermometers
- 42i-1/32 Index reading devices in liquid thermometers
- 42i-2 Maximum/minimum thermometers, operated by the expansion of liquid materials

Thermometers [heat measuring devices] operated by the expansion of solid materials

- 42i-3 in the form of stretched, bent plates or diaphragms (42q-2/01; 42q-2/03; 42q-2/04)
- 42i-4/01 in the form of straight rods
- 42i-4/02 in the form of hinged rods
- 42i-4/03 in the form of stretched wires and strips
- 42i-4/04 Bimetal thermometers with mechanical indicators
- 42i-4/05 Bimetal thermometers with electric indicators, bimetal contact thermometers
- 42i-5 Thermometers (heat measuring devices) operated by the displacement of a column of liquid as a result of the expansion of gaseous or vapour-like materials and the evaporation of liquid materials
- 42i-6/01 Thermometers with elastic tubes: Bourdon tubes
- 42i-6/02 Thermometers with expansion bulbs (42q-2/02)
- 42i-7/01 Electric resistance thermometers
- 42i-7/50 Bolometers
- 42i-8/01 Various materials for thermocouples
- 42i-8/02 Connections and measuring methods for thermoelements
- 42i-8/50 Radiation pyrometers with thermoelements
- 42i-8/60 Radiation pyrometers with other heat-sensitive elements, bimetal pyrometers
- 42i-8/70 Protecting devices for all kinds of pyrometers, including optical pyrometers
- 42i-8/80 Protecting tubes for resistance thermometers and thermoelements

- 42i-8/90 Mounting of resistance thermometers and thermoelements, pyrometer heads
 42i-8/91 Radiation protection for thermometers of all kinds
 42i-9/01 Optical pyrometers adjustable to vanishing: half-shadow arrangement, vanishing of the filament of the standard lamp and the like
 42i-9/10 Optical colour pyrometers
 42i-9/20 Optical pyrometers with photosensitive cells
- Thermometers
- 42i-10/01 with hydrometers, floats
 42i-10/02 with gas ionisation
 42i-10/03 operated by magnetic variation
 42i-10/04 operated by evaporation and melting, sintering and freising
 42i-10/05 Acoustic pyrometers
 42i-10/20 operated by temperature or pressure differences in pipes for flowing media
 42i-11/01 Mean temperature meters
 42i-11/02 Measuring devices for the duration of the effect of heat
 42i-11/03 Differential thermometers, also for central-heating installations taking into account the external temperature
 42i-11/04 Thermometers for moving, especially revolving, bodies
 42i-11/05 Surface thermometers (42i-1/03)
 42i-11/06 Thermometers introduced into stored goods or into the ground
 42i-11/50 Thermometers of all kinds with compensation devices for the room temperature (remote indication 74b)
- 42i-12/01 Thermostatically controlled cabinets, thermostats, water baths as laboratory apparatus (thermostatically controlled cabinets as kitchen apparatus and the like 34i-11/01)

Measuring devices

- 42i-12/02 for heat conductivity
 42i-12/03 for heat expansion, dilatometers
 42i-12/04 for specific heat
 42i-12/05 for heat transmission and transfer
 42i-12/06 for melting points
 42i-12/07 for boiling points
- 42i-16/01 Calorimeters, instruments for the measurement of the calorific value
 42i-16/02 Bomb calorimeters
- 42i-17/01 Heat-quantity meters for central-heating installations, mechanical
 42i-17/02 Heat-quantity meters with thermoelements and resistance thermometers
 42i-17/03 Heat-quantity meters with condensation, evaporation, or melting
- 42i-18 Instruments for the measurement of the humidity of steam
- 42i-19/01 Humidity meters for air with hygroscopic substances (for solid materials 42i-9/50, 42i-9/51; installations for the regulation of room humidity 36d-1/14)
 42i-19/02 Psychrometers
 42i-19/03 Humidity meters, with colour-changing substances
 42i-19/04 Humidity meters operated by electrical conductance or capacitance variations
 42i-19/05 Dew point mirrors
- 42i-20/01 Meteorological instruments, weather instrument columns
 42i-20/02 Actinometers, heliographs
 42i-20/03 Instruments for the measurement of climate data, katathermometers and the like
 42i-20/04 Rain gauges

42k Force-measuring devices [including dynamometers], pressure gauges, indicators, test tunnels; test stands for building structures, structural and machine elements, internal combustion

engines, hollow bodies and vehicles; testing devices for springs, for tools, for measuring material bending and for the determination of the load capacity of foundation soils; road-testing machines; leakage detectors; balancing machines; testing of metallic materials and of non-metallic solid materials, testing of textiles, rubber, leather, paper, paints and glues

Force-measuring devices [including dynamometers]

- 42k-1/01 Rotation or transmission dynamometers
- 42k-1/02 Torsion dynamometers, mechanical
- 42k-1/03 Torsion dynamometers, optical
- 42k-1/04 Torsion dynamometers, electrical
- 42k-2/01 Brake dynamometers, mechanical
- 42k-2/02 Brake dynamometers, air or liquid
- 42k-2/03 Brake dynamometers, electrical, including pendulum dynamos
- 42k-3 Hydraulic dynamometers, e.g. liquid measuring gauges
- 42k-4 Devices for gauging pressures in flowing liquids and gases, e.g. dynamic pressures, drafts in furnace, ventilation and air conditioning installations
- 42k-5 Wind pressure gauges (wind velocity meters 42o-15)
- 42k-6 Dynamometers for games and sports (77a-5/01; 77a-7/04; 77a-8/04; 77a-9/01; 77a-21/00; 77a-21/30; 77a-23/04)
- 42k-7/01 Axial-thrust measuring devices
- 42k-7/02 Devices for measuring forces transmitted by pulling members, e.g. by belts, ropes, cables wires, strands (the measuring of stresses [strains] 42k-41, 42k-45, 42k-50)
- 42k-7/03 Traction dynamometers for vehicles
- 42k-7/04 Devices for measuring the gas pressure in firearms, and internal combustion engines, the explosive power of explosives, the penetrating force of projectiles and the recoil of firearms
- 42k-7/05 Miscellaneous dynamometers, including mechanical work and power meters

Pressure gauges (remote indication devices 74b)

- 42k-8 Elastic tube manometers
- 42k-9/01 Plate-spring diaphragm, membrane, manometers
- 42k-9/02 Bellows manometers
- 42k-9/03 Aneroid barometers
- 42k-10/01 Piston manometers
- 42k-10/02 Manometers for pneumatic tyres (63e-17)
- 42k-11/01 Liquid manometers
- 42k-11/02 Liquid barometers
- 42k-11/03 Immersed-bell and float manometers
- 42k-11/04 Ring manometers
- 42k-12/01 Differential manometers without liquid
- 42k-12/02 Differential manometers with liquid
- 42k-12/03 Vacuum gauging, McLeod method
- 42k-12/04 Vacuum gauging, electrical methods
- 42k-12/05 Pressure gauges with contact electrical resistances or magnetic arrangements, solenoids
- 42k-12/06 Pressure gauges with level-compensating or temperature-compensating devices, two or more liquids
- 42k-12/07 Pressure gauges with regulating devices (42q-1)
- 42k-12/08 Pressure gauges with signalling and controlling devices
- 42k-12/09 Double manometers with two or more pointers
- 42k-13 Protecting devices for manometers
- 42k-14/01 Reading, indicating and illuminating devices for manometers and barometers

42k-14/02	Recording and counting devices for manometers and barometers
42k-14/03	Miscellaneous details of manometers and barometers
42k-14/04	Pressure gauges of various kinds, such as photoelectric or piezoelectric, or such as operate by controlling electrical oscillating circuits or the like
42k-14/10	Testing and calibrating devices for manometers
	Indicators
42k-15	Indicators with external springs
42k-16	Indicators with internal springs
42k-17	Optical indicators
42k-18/01	Miscellaneous indicators
42k-18/02	Electrical power meters
42k-18/03	Planimetering and integrating indicators
42k-19/01	Miscellaneous devices for indicators
42k-19/02	Recording devices for indicators, structures and drives therefor
42k-19/03	Common recording devices for several indicators
42k-19/04	Cord-transmission arrangements and drums for indicators
	Mechanic, metallurgic and other methods for material testing
42k-20/01	Static testing of strength of materials, e.g. tension, yielding, machines for testing materials
42k-20/02	Dynamic testing of strength of materials by changing tension loads, pressure loads, torsion loads and bending loads, also in combination, machines for testing fatigue strength
42k-20/03	Electric, magnetic, mechanic and thermal methods for testing of metals in respect of inhomogenities, e.g. cracks, cavities, uneven tempering, in respect of strength, e.g. of weld seams, or in respect of mechanical composition and structure (21e-12; construction and circuits of X-ray tubes in general 21g-17 – 21g-20, radiation with neutron beams, ion beams and electron beams, also of radioactive origin 21g-21, chemical analysis 42l-3/53)
42k-21/01	Clamping devices, thrust blocks and supports
42k-21/02	Dynamometers
42k-21/03	Indicating and recording devices, especially for tension
	Machines for material testing
42k-22/01	for threads, ribbons, fabrics, paper, leather etc.
42k-22/02	for metal wire and sheet metal
42k-22/03	for ropes, steel wires and cables (35a-26)
42k-22/04	for chains
	Machines for testing of hardness
42k-23/01	Testing hardness of metal in general by penetration methods with balls or cones or by determining differences in penetration depth; machines for testing ball impact hardness, pyramid impact hardness, drop hardness, pendulum hardness and scratch hardness
42k-23/02	for files
42k-23/03	for abrasive discs
42k-23/04	for different substances, e.g. paints, varnishes, rubber
	Machines for testing elasticity
42k-24/01	of rubber, leather and like yielding materials
42k-24/02	of springs and piston rings, machines for testing springs
42k-24/03	Machines for compression testing
42k-25	Machines for testing rods and plates by bending, shearing and buckling, impact testing machines

42k-26	Devices for measuring deflection of beams, rails, trusses, bridges, floating bodies, overhead lines, etc.
42k-27	Measuring the torsion strength of workpieces
42k-28	Testing the strength of concrete, stone, glass and like building materials
42k-29/01	Test tunnels with various testing media, such as air, gas, water and the like, e.g. wind tunnels (ship resistance 65a1-10/01), testing stands for engines and airplane propellers (62c-11)
42k-29/02	Test stands and devices for vehicles or parts thereof, for testing the braking action of brakes
42k-29/03	Devices for testing the strength of pipes, vessels and other hollow bodies
42k-29/04	Devices for testing impact, shock and cutting tools (87b-1; 87b-2/20)
42k-29/05	Devices for testing wear or friction, especially in bearings (42I-7/03; 42I-7/04)
42k-29/06	Devices for the determination of the load capacity of foundation soils, underground and above-ground structures, e.g. masonry, roofs and ceilings, shaft linings and piles
42k-29/07	Testing manometers and weighing devices
	Detecting leakage (leakage measurement 42I-1/01 – 42I-1/03; 42I-2/01 – 42I-2/03)
42k-30/01	Detecting leakage of hollow bodies, e.g. boxes, barrels, bottles and cans; utilisation of compressed water, compressed air or vacuum as testing media (for preserving containers filled with foodstuffs 53b-3)
42k-30/02	Detecting leakage of pipes (of gas pipes 4c-19)
42k-30/03	Detecting leakage of pipelines, pipe joints and valves (gas pipelines 4c-19)
42k-30/04	Detecting leakage odour by means of smoke, sound, chemical or electrical effects
42k-31	Testing leakage of miscellaneous materials, e.g. balloon fabrics, leather, cloth, in respect of porosity (testing leakage of cable sheathing by electrical methods 21c-3/12)
	Determination of mass distribution of machine elements (46a11-1 – 46a11-4; 47h-25 – 47h-27)
42k-32	Devices for determination of the centre of gravity and for static counterbalancing
42k-33	Devices for dynamic counterbalancing (vibration meters 42c-42)
	Test tunnels, test stands for building structures, structural and machine elements, hollow bodies and vehicles, testing devices for springs, for tools, for measuring material bending and for the determination of the load capacity of foundation soils, road-testing machines, balancing machines
42k-20	Test tunnels for general purposes with various testing media, such as air, gas, water, sand and the like, e.g. wind tunnels (ship resistance 65a1-10/01)
42k-21/01	Testing stands and devices for testing completed buildings by vibration engineering and for strength, e.g. for bridges, structural and machine elements, trusses, measuring instruments, e.g. vibration test vehicles and vibrating tables
42k-21/02	Test stands for gear drives for testing the strength of the teeth (testing gear size accuracy wheels 42b-26/02)
42k-22/01	Test stands for testing the performance and strength of internal combustion engines, in particular aircraft engines
42k-22/02	Test stands for testing the strength of aircraft propellers (62c-11)
42k-22/03	Devices for indicating internal combustion engine knocking, methods and devices for the determination of the antiknock characteristics of fuels
42k-23	Test stands for testing the strength of hollow bodies, e.g. for carrying out water-pressure tests and for the determination of the resistance of casings, in particular those of electrical apparatus and machines, against explosive pressure
42k-24	Test stands and devices for vehicles, especially motor vehicles, for testing the braking action of brakes
42k-25	Testing devices for springs and piston rings for testing of strength and spring characteristics

- 42k-26 Testing devices for files, impact, shock and cutting tools for testing strength, hardness and cutting characteristics, for measuring the effect, impact and percussion effect, cutting power
- 42k-27 Testing devices for the measurement of the deflection of beams, rails, supporting structures, bridges, floating bodies, overhead lines, etc.
- 42k-28 Testing devices for the determination of the load capacity of foundation soils, underground and above-ground structures, e.g. masonry, roofs and ceilings, shaft linings and piles
- 42k-29 Road-testing machines
- Leakage detectors** (leakage detectors for cable casing 21e-3/12; for gas masks and respirators 61a-29/40; for pneumatic tyres 63e-18/01)
- 42k-30/01 Leakage detectors for hollow bodies, e.g. boxes, barrels, bottles and cans; utilisation of compressed water, compressed air or vacuum as testing media (for preserving containers filled with foodstuffs 53b-3)
- 42k-30/02 Leakage detectors for pipes (gas pipes 4c-19)
- 42k-30/03 Leakage detectors for pipes, joints and valves (gas pipes 4c-19)
- 42k-30/04 Leakage detectors responsive to odour or smoke, sound, chemical or electrical effects
- Determination of mass distribution** (mass equalisation 14a-15, 46a11-1, 46a11-4; 47h-25 – 47h-27)
- 42k-31 Methods and devices for the determination of moments of inertia
- 42k-32 Methods and devices for the determination of the centre of gravity and for static counterbalancing (21d1-50)
- 42k-33 Methods and devices for dynamic counterbalancing (21d1-50; vibration meters 42c-42)
- Mechanical technological and metallographical testing of metallic materials** (chemical testing 42l), **non-destructive testing of materials, testing of textiles, rubber, leather, paper, paints and glues**
- Testing of metallic materials**
- Methods, devices and machines for the determination of the behaviour of materials under various stresses
- 42k-34/01 under static stresses of short duration, e.g. under tensile, compression, bending, torsion, shearing and multi-axial stresses
- 42k-34/02 under single impact stress, e.g. tensile impact, impact compression, impact-torsion, impact-bending and indentation-impact bending stresses; pendulum impacting devices, impacting devices with drop testing devices
- 42k-34/03 under repeated impact stress, e.g. repeated impact-bending and repeated impact tensile stresses, devices for repeated impacting, etc.
- 42k-34/04 under vibration stresses, e.g. for the determination of the fatigue strength and material damping with test bars
- 42k-34/05 at high temperatures, also furnaces, e.g. for the determination of the creep strength
- 42k-34/06 at low temperatures
- 42k-34/07 Methods and devices for producing uniform temperatures along the gauge length of test bars, in particular for heat tensile and creep tests
- 42k-35 Methods and devices for the verification and calibration of testing machines
- Methods, devices and machines for the determination of hardness
- 42k-36/01 for the determination of ball-impact hardness, e.g. Brinell hardness, Meyer hardness, and of cone-impact hardness
- 42k-36/02 for the determination of initial load hardness (Rockwell hardness) and pyramid impact hardness (Vickers hardness)
- 42k-36/03 for the determination of scratch hardness, friction hardness
- 42k-36/04 for the determination of pendulum hardness

- 42k-36/05 for the determination of drop hardness, rebound hardness, e.g. scleroscope hardness, impact hardness
- 42k-36/06 for the determination of hardness by magnetic means
- 42k-36/10 Miscellaneous hardness-testing methods and devices
- Methods and devices for carrying out technological tests**
- 42k-37/01 for carrying out bending and folding tests, the forging and compression tests, the ring, bead and pipe compression tests
- 42k-37/02 for carrying out the cupping, deep-drawing and wedge-drawing tests
- 42k-37/03 for carrying out the reverse bending test, winding test and the like
- Miscellaneous tests**
- 42k-38/01 Methods, devices and machines for the determination of the wear of materials and of the resistance to wear
- 42k-38/02 Methods and devices for the determination of friction, in particular the friction in bearings
- 42k-38/03 Determination of the adhesive strength of metallic coatings applied to workpieces
- 42k-39 Methods and devices for the determination of the cutting and working characteristics
- 42k-40 Methods and devices for the determination of the resistance to erosion
- 42k-41 Strength testers for wire ropes, ropes, cables (35a-26)
- 42k-42 Strength testers for chains
- Clamping, indicating and recording devices for material testing machines, expansion-and strain-measuring devices**
- 42k-43 Clamping devices, thrust blocks and supports
- 42k-44 Indicating and recording devices
- Methods and devices for the determination of the expansion of test bars and technical structures, as well as of the strains in structural and machine elements**
- 42k-45/01 Stress and strain measurement by mechanical means
- 42k-45/02 Stress and strain measurement by optical means
- 42k-45/03 Stress and strain measurement by electromagnetic or electrical means
- 42k-45/04 Stress and strain measurement by radiographic means
- 42k-45/05 Stress and strain measurement by acoustical means
- Non-destructive testing of materials**
- Methods, devices and machines for the detection of flaws, e.g. cracks, pipes, luminations, strain hardened areas and inclusions in work pieces and weld seams, and for the determination of the depth of hardening in hardened steels**
- 42k-46/01 Testing by mechanical means
- 42k-46/02 Testing by thermal means
- 42k-46/03 Testing by magnetic means, e.g. by the magnetic-powder method (determination of magnetic properties 21e-37)
- 42k-46/04 Testing by electrical means (determination of electric properties 21e-37)
- 42k-46/05 Testing by acoustical means; sound test
- 42k-46/06 Testing by means of ultrasonic oscillations
- 42k-46/07 Testing by means of X-rays, gamma rays and other rays (X-ray tube structures and circuits in general 21g-17 – 21g-20, 21g-21/10)
- 42k-46/10 Testing by other methods, e.g. oil boiling test
- 42k-47 Methods and devices for the determination of holes in thin-walled bodies, e.g. metal and strips and sheets
- Metallographical testing**
- 42k-48 Determination of the material structure, e.g. by etching (etching methods), production of microsections

Methods, devices and machines for testing non-metallic solid materials, e.g. building materials, for mechanical or strength characteristics

- 42k-49/01 for testing wood
- 42k-49/02 for testing natural stones and fired bricks, e.g. cement and concrete (also for water permeability), of moulding sand samples (also for gas permeability), enamel, glass, porcelain
- 42k-49/03 for testing abrasive disks; hardness testing
- Textile testing
- 42k-50 Methods, devices and machines for testing fibres, threads, yarns and fabrics for mechanical and strength characteristics, for stresses, mechanical irregularities, twist (torsion), porosity
- Testing of rubber, synthetic resins and leather
- 42k-51 Methods, devices and machines for testing rubber, synthetic resins, leather and similar elastic materials and articles manufactured from them, for mechanical and strength characteristics, adhesive strength, porosity (leakage detection in pneumatic tyres 63e-18/01)
- Paper testing
- 42k-52 Methods, devices and machines for testing paper, cardboard, pasteboard and the like for mechanical and strength characteristics, e.g. for tensile strength, resistance to picking, bursting strength, resistance to tearing, adhesive strength, porosity
- Testing of paints, glues and pencil leads
- 42k-53 Testing of paints for hardness, adhesive strength, elasticity, sanding capacity, and mechanical testing of glues, determination of bonding strength; pencil-lead testing, e.g. for hardness and wear

42I Chemical and physical methods and apparatus for testing materials**Determination of the density of materials, also for analytical purposes**

- 42I-1/01 Determination of the density of solid materials (42I-9/01)
- 42I-1/02 Determination of the density of liquid materials by means of floats, e.g. hydrometers; also pipettes with hydrometers, "acid testers"
- 42I-1/03 Miscellaneous methods and apparatus for the determination of the density of liquid materials
- 42I-2/01 Determination of the density of gaseous or vapour-like materials on the basis of the flow thereof through nozzles (gas analysis on the basis of the flow thereof, through nozzles (in combination with capillaries 42I-4/11; in conjunction with absorption or combustion 42I-4/05; on the basis of the diffusion capacity 42I-4/12)
- 42I-2/02 Determination of the gas density by weighing, gas balances and the like
- 42I-2/03 Miscellaneous methods and apparatus for the determination of gas density

Analysis of solids and liquids (42I-1/01 – 42I-1/03; 42I-5/01; 42I-5/02; 42I-9/50; 42I-9/51)**Methods and apparatus for general analytical purposes**

- 42I-3/01 Purely chemical methods of analysis
- 42I-3/02 Apparatus and materials for chemical analysis, e.g. titration devices, burettes, accessories for paper chromatography
- 42I-3/03 Automatic apparatus for chemical analysis
- 42I-3/04 Electrochemical analysis through conductivity measurement
- 42I-3/05 Electrochemical analysis through potential determination
- 42I-3/06 Miscellaneous electrochemical methods of analysis, e.g. electrophoresis
- 42I-3/07 Thermochemical analysis
- 42I-3/08 Optical analysis, also by means of X-rays (turbidimeters 42h-17/06; spectro-analytical apparatus 42h-20/01)

- 42I-3/09 Other, especially combined methods of analysis, e.g. by means of radioactive rays, mass spectroscopy, nuclear resonance
- Methods and apparatus
- 42I-3/50 for the analysis of water
- 42I-3/51 for the analysis of soil
- 42I-3/52 for the analysis of coal and ores
- 42I-3/53 for the analysis of metals and alloys and their inclusions
- 42I-3/54 for the analysis of blood and urine (colorimeters for the determination of haemoglobin 42h-18/01; polarisation saccharimeters 42h-21)
- 42I-3/55 for the analysis of miscellaneous, not previously mentioned materials
- Gas analysis, also firedamp indication (42I-2/01 – 42I-2/03)**
- 42I-4/01 Sampling
- 42I-4/02 Methods and apparatus for chemical gas analysis, e.g. gas burettes, absorption vessels, explosion pipettes
- 42I-4/03 Hand apparatus for the chemical gas analysis by means of absorption or combustion, indication of the volume or pressure change
- 42I-4/04 Intermittently operating automatic apparatus for chemical gas analysis by means of absorption or combustion, indication of the volume or pressure change
- 42I-4/05 Automatic apparatus for chemical gas analysis by absorption or combustion with continuously flowing gas
- 42I-4/06 Gas analysis on the basis of indicator colouring and the like
- 42I-4/07 Gas analysis on the basis of the structure of a flame
- 42I-4/08 Gas analysis by combustion and temperature measurement
- 42I-4/09 Gas analysis by measurement of the explosive capacity
- 42I-4/10 Gas analysis by measurement of the heat conductivity
- 42I-4/11 Gas analysis by measurement of the viscosity, e.g. by means of capillaries, also in conjunction with nozzles (combined with absorption or combustion 42I-4/05; nozzles only 42I-2/01)
- 42I-4/12 Gas analysis by measurement of the diffusion capacity
- 42I-4/13 Optical gas analysis, also by measurement of absorptivity with respect to light, heat, or other rays
- 42I-4/14 Acoustical gas analysis
- 42I-4/15 Determination of solid and liquid components in gases
- 42I-4/16 Miscellaneous gas-analytical methods and apparatus
- Examination of milk and dairy products**
- 42I-5/01 Chemical examination
- 42I-5/02 Physical and physicochemical examination, e.g. measurement of the electric conductivity
- 42I-5/03 Determination of the fats by separation, butyrometers
- 42I-5/04 Miscellaneous methods and apparatus for fat determination
- 42I-5/05 Determination of dirt, curds, etc.
- 42I-5/10 Other examination methods for milk, etc.
- 42I-6/01 Centrifuges and accessories for the centrifugation of samples of milk and other liquids
- 42I-6/02 Portable equipment for milk examination, also with centrifuges
- Testing of viscous materials and lubricants**
- 42I-7/01 Determination of the viscosity of materials on the basis of the flow thereof through a constriction
- 42I-7/02 Miscellaneous methods and apparatus for the determination of viscosity
- 42I-7/03 Testing of lubricating power, test machines and the like
- 42I-7/04 Miscellaneous tests of lubricants, e.g. determination of the boundary angle, of the resistance to oxidation

- 42I-8 Determination of the flash point of petroleum and other fuels
- 42I-9/01 Examination of grain, also volumetric weight determination
- 42I-9/02 Examination of flour, dough and fermenting agents, general
- Determination of the water content of solid and liquid substances
- 42I-9/50 by evaporating or decomposing the water, or by similar methods
- 42I-9/51 by determining the physical, especially electrical, characteristics of the humid substance
- 42I-11 Alcohol measuring and inspecting apparatus for revenue purposes
- 42I-12 Measuring and inspection apparatus for breweries and sugar factories for revenue purposes
- Miscellaneous laboratory methods and apparatus**
- 42I-13/01 Miscellaneous methods and apparatus of general application, e.g. test tubes, flasks, crucibles (12a - 12d), stands and holders (42c-1/01 – 42c-1/02), desiccators, gas generators
- 42I-13/02 Methods and apparatus for distillation and extraction, also coolers (12a-5; 12a-6; 12c-1)
- 42I-13/03 Methods and apparatus for various physicochemical measurements, e.g. of the osmotic pressure, of the boiling-point elevation, of the freezing-point depression, of the surface tension, of the adsorptivity and absorptivity, and of the solubility
- 42I-13/04 Miscellaneous methods and apparatus for special purposes, e.g. for the determination of the resistance of materials to chemical and atmospheric influences (corrosion), for the determination of grain or mill sizes of powders (screen analysis)
- 42I-17 Samplers for solid materials
- 42I-18 Samplers for liquid materials
- 42m** **Computers: slide rules, disk calculators, computing tables, calculating machines** (Russian abaci 42n-3; calculating machines or devices for the computation of ballistic data 72f)
- Adding machines without printing mechanism**
- 43m-1 with one set of keys
- 43m-2 with several sets of keys
- 43m-3 with directly adjustable figure or counter wheels
- 43m-4 with setting levers, rods, screws, etc.
- 43m-5 with setting chains
- Adding machines with printing mechanism**
- 43m-6 with one set of keys
- 43m-7 with several sets of keys
- 43m-8 without keys
- 43m-9 Adding devices with number slides
- Calculating or multiplying machines**
- 43m-10 Peg-wheel calculating machines [Odhner machines] with setting levers and the like
- 43m-11 Peg-wheel calculating machines [Odhner machines] with setting keys
- 43m-12 Stepped-wheel calculating machines [Thomas machines]
- 43m-13 Calculating machines with multiplication-table units
- 43m-14 Electric calculating machines
- 43m-15 Various calculating machines
- 43m-16 Calculating devices for typewriters (15g)
- Components of calculating machines** (42p-10/02; 42p-10/03; 43a-13/04)
- 43m-17 Mechanism for carrying of tens in general
- 43m-18 Mechanisms for carrying of tens in peg-wheel calculating machines [Odhner machines]

43m-19	Mechanisms for the carrying of the tens in stepped-wheel calculating machines [Thomas machines]
43m-20	Zero-setting in counting mechanisms
43m-21	Zero-setting or resetting mechanisms for setting devices
43m-22	Drives in general
43m-23	Drives for subtractive calculations
43m-24	Motor drives in general
43m-25	Multiplication and division drives
43m-26	Locking devices in general
43m-27	Brake and catch mechanisms
43m-28	Reversal and overthrow preventers
43m-29	Printing mechanisms
43m-30	Revolution-counting devices
43m-31	Carriage shifts
43m-32	Miscellaneous elements

Logarithmic slide rules and other logarithmic calculating devices

43m-33/01	Linear slide rules
43m-33/02	Circular slide rules
43m-33/03	Cylindrical slide rules
43m-33/04	Slides for slide rules
43m-33/05	Miscellaneous logarithmic calculating devices
43m-34	Computing and product tables
43m-35	Calculating devices for the computation of interests and wages
43m-36	Miscellaneous calculating devices, not mentioned before
43m-37	Nomographic computing devices

42m1	(IPC: G06C) Digital computers in which all the computation is effected mechanically (score computers for card games 77d-1/18; construction of keys, printing mechanisms, or other parts of general application to the typewriting or printing art 15)
42m1-1/00	Computing aids in which the computing members form at least part of the displayed result and are manipulated directly by hand, e.g. abacus, pocket adding device
42m1-3/00	Arrangements for table look-up, e.g. menstruation table (with computation by mechanical gearing 42m1-1/00)
42m1-5/00	Non-functional elements (driving mechanisms 42m1-23/00)
42m1-5/02	. Housings; Frameworks
42m1-7/00	Input mechanisms
42m1-7/02	. Keyboards
42m1-7/04	. . Interlocking devices, e.g. between keys
42m1-7/06	. . with one set of keys for each denomination
42m1-7/08	. . with one set of keys for all denominations, e.g. ten-key board
42m1-7/09	. Transfer of data from record carriers to computing mechanisms (sensing record carriers 42m6-7/00)
42m1-7/10	. Transfer mechanisms, e.g. transfer of a figure from a ten-key keyboard into the pin carriage
42m1-7/12	. Resetting devices, e.g. for the keyboard
42m1-9/00	Transfer mechanisms, e.g. for transmitting figures from the input mechanism into the computing mechanism (42m1-7/10, 42m1-11/00, 42m1-15/00 take precedence)
42m1-9/02	. Back-transfer arrangements, e.g. to transfer a value accumulated in a register back into the selection mechanism

- 42m1-11/00 Output mechanisms** (marking record carriers in general, visual presentation in general of results of the mathematical operations 42m6)
- 42m1-11/02 . with visual indication, e.g. counter drum
 - 42m1-11/04 . with printing mechanisms, e.g. for character-at-a-time or line-at-a-time printing
 - 42m1-11/06 . . having type hammers
 - 42m1-11/08 . with punching mechanism
 - 42m1-11/10 . Arrangements for feeding single sheets or continuous web or tape, e.g. ejection device (conveying record carriers 42m6-13/00); Line-spacing devices
 - 42m1-11/12 . . for feeding tape
 - 42m1-13/00 Storage mechanisms (mechanical counters with input only to the lowest order 42m6; information storage in general 42t)
 - 42m1-13/02 . Operand stores
 - 42m1-13/04 . Print buffer stores
- 42m1-15/00 Computing mechanisms; Actuating devices therefor** (mechanisms for operating automatically upon more than two numbers otherwise than by repeated addition or subtraction 42m1-21/00)

Note:

Group 42m1-15/02 takes precedence over groups 42m1-15/04 to 42m1-15/42

- 42m1-15/02 . operating on the binary scale
 - 42m1-15/04 . Adding or subtracting devices (42m1-15/08 takes precedence)
 - 42m1-15/06 . . having balance totalising; Obtaining subtotal
 - 42m1-15/08 . Multiplying or dividing devices; Devices for computing the exponent or root
 - 42m1-15/10 . . having more than one denominational set of keys operating directly on computing mechanism
 - 42m1-15/12 . . having pin carriage
 - 42m1-15/14 . . having pin wheel, e.g. Odhner type
 - 42m1-15/16 . . having stepped-toothed actuating drums, e.g. Thomas type
 - 42m1-15/18 . . having multiplication table for forming partial products
 - 42m1-15/20 . . specially adapted for short-cut multiplication
 - 42m1-15/22 . Arrangements for two or more computing devices; Arrangements for subdivision into two or more computing mechanisms, e.g. splitting
 - 42m1-15/24 . Devices for counting the cycles of operation in division or multiplication
 - 42m1-15/26 . Devices for transfer between successive orders, e.g. tens-transfer device
 - 42m1-15/28 . . where transfer is effected in one step
 - 42m1-15/30 . . where transfer is effected in two steps
 - 42m1-15/32 . . . with provision for simultaneous transfer between all orders
 - 42m1-15/34 . . where transfer is effected continuously by planet gear, i.e. crawl type
 - 42m1-15/36 . . . with aligning means
 - 42m1-15/38 . . for pin-wheel computing mechanisms
 - 42m1-15/40 . . for stepped-toothed-drum computing mechanism
 - 42m1-15/42 . Devices for resetting to zero or other datum
 - 42m1-15/44 . Devices for comparing numerical values, e.g. zero check
 - 42m1-15/46 . Arrangements for rounding-off
 - 42m1-15/48 . Arrangements for selection of one out of several counting registers (arrangements for controlling subsequent operating functions 42m1-21/04; item counters 42m1-25/02)
- 42m1-17/00 Mechanisms for converting from one notational system to another, i.e. radix conversion**
- 42m1-19/00 Decimal-point mechanisms; Analogous mechanisms for non-decimal notations**
- 42m1-19/02 . Devices for indicating the point
 - 42m1-19/04 . Devices for printing the point
- 42m1-21/00 Programming-mechanisms for determining the steps to be performed by the computing machine, e.g. when a key or certain keys are depressed**

	(mechanisms merely for producing multiplication by repeated addition 42m1-15/08)
42m1-21/02	. in which the operation of the mechanism is determined by the position of the carriage
42m1-21/04	. Conditional arrangements for controlling subsequent operating functions, e.g. control arrangement triggered by a function key and depending on the condition of the register
42m1-23/00	Driving mechanisms for functional elements (42m1-23/08 takes precedence over 42m1-23/02 to 42m1-23/06)
42m1-23/02	. of main shaft
42m1-23/04	. of pin carriage, e.g. for step-by-step movement
42m1-23/06	. of tabulation devices, e.g. of carriage skip
42m1-23/08	. Hydraulic or pneumatic actuation
42m1-25/00	Auxiliary arrangements, e.g. interlocks (interlocks in keyboards 42m1-7/04)
42m1-25/02	. Item-counting devices
42m1-27/00	Computing machines characterised by the structural interrelation of their functional units,
42m1-27/02	. Cash registers (without computing mechanism 43a4)
42m1-29/00	Combinations of computing machines with other machines, e.g. with typewriter, with money-changing apparatus
42m2	(IPC: G06D) Digital fluid-pressure computing devices

Note:

This subclass includes all devices in which at least one computing function is performed by hydraulic or pneumatic means.

42m2-1/00	Details, e.g. functional units (individual logic elements 60b; valves 47g)
42m2-1/02	. having at least one moving part, e.g. spool valve
42m2-1/04	. . Adding; Subtracting
42m2-1/06	. . Multiplying; Dividing
42m2-1/08	. having no moving parts
42m2-1/10	. . Adding; Subtracting
42m2-1/12	. . Multiplying; Dividing
42m2-3/00	Computing devices characterised by the interrelationship of the functional units and having at least one moving part
42m2-5/00	Computing devices characterised by the interrelationship of the functional units and having no moving parts
42m2-7/00	Computing devices characterised by the combination of hydraulic or pneumatic functional elements with at least one other type of functional element
42m3	(IPC: G06F) Digital computers in which at least part of the computation is effected electrically; Arrangements for handling digital data (computers in which a part of the computation is effected hydraulically or pneumatically 42m2; self-contained input or output peripheral equipment 42m6)

Note:

In this subclass: The expression "handling" includes processing or transporting of data

42m3-1/00	Details of data-processing equipment not covered by groups 42m3-3/00 to 42m3-13/00
42m3-1/02	. Digital function generators
42m3-1/04	. Generating or distributing clock signals or signals derived directly therefrom

42m3-3/00	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 (typewriters 15g; conversion of physical variables 60a-5/00; coding or decoding in general 21a1-36/20; data transmission 21a1)
42m3-3/02	. Manual, e.g. key, switch, dial
42m3-3/04	. Digital input from, or digital output to, one or more distinct stations (data transmission 21a1)
42m3-3/05	. Digital input using the sampling of an analogue quantity at regular intervals of time (analogue/digital conversion per se 21a1-36/00; sampling per se 21a1-36/00)
42m3-3/06	. Digital input from, or digital output to, record carriers
42m3-3/08	. . from or to individual record carriers, e.g. punched card
42m3-3/10	. Digital input from or digital output to electric typewriter
42m3-3/12	. Digital output to print unit (print units per se 42m6-15/00)
42m3-3/14	. Digital output to display device, e.g. cathode-ray tube (output equipment with visual indication without printing 42m6-15/18)
42m3-3/16	. Sound input; Sound output
42m3-5/00	Methods or arrangements for data conversion without changing the order or content of the data handled (by coding or decoding 21a1-36/20)
42m3-5/02	. for converting multi-digit numbers from one notational system to another, e.g. decimal to four-line binary
42m3-5/04	. for series/parallel conversion or vice versa and adapted for conjoint operation with a processing unit
42m3-5/06	. for changing the speed of data flow, i.e. speed regularising
42m3-7/00	Methods or arrangements for processing data by operating upon the order or content of the data handled (logic circuits 21a1-36/00)
42m3-7/02	. Comparing digital values (42m3-7/06, 42m3-7/22, 42m3-7/38 take precedence; comparison of characteristics of individual pulses 21a1-36/00)
42m3-7/04	. . Identity comparison, i.e. for like or unlike values
42m3-7/06	. Arrangements for sorting, selecting, merging, or comparing data on individual record carriers (sorting of postal letters 43a5, 81e; conveying record carriers from one station to another 42m6-13/02)
42m3-7/08	. . Sorting, i.e. grouping record carriers in numerical or other ordered sequence according to the classification of at least some of the information they carry (by merging two or more sets of carriers in ordered sequence 42m3-7/16)
42m3-7/10	. . Selecting, i.e. obtaining data of one kind from those record carriers which are identifiable by data of a second kind from a mass of ordered or randomly-distributed record carriers
42m3-7/12	. . . with provision for printing-out a list of selected items
42m3-7/14	. . Merging, i.e. combining at least two sets of record carriers each arranged in the same ordered sequence to produce a single set having the same ordered sequence
42m3-7/16	. . . Combined merging and sorting
42m3-7/20	. . Comparing separate sets of record carriers arranged in the same sequence to determine whether at least some of the data in one set is identical with that in the other set or sets
42m3-7/22	. Arrangements for sorting, selecting, merging, or comparing data on continuous record carriers, e.g. tape, drum, disc
42m3-7/24	. . Sorting, i.e. extracting data from one or more carriers, re-arranging the data in numerical or other ordered sequence, and re-recording the sorted data on the original carrier or on a different carrier or set of carriers (42m3-7/36 takes precedence)
42m3-7/26	. . . the sorted data being recorded on the original record carrier within the same space in which the data had been recorded prior to their sorting, without using intermediate storage
42m3-7/28	. . Selecting, i.e. choosing digital data of a predetermined kind from a record carrier which has two or more kinds of digital data
42m3-7/30	. . . with provisions for printing-out a list of selected items

- 42m3-7/32 . . Merging, i.e. combining data contained in ordered sequence on at least two record carriers to produce a single carrier or set of carriers having all the original data in the ordered sequence (42m3-7/36 takes precedence)
- 42m3-7/34 . . Comparing separate record carriers with data arranged in the same sequence to determine whether at least one of the data on one carrier is identical with that on the other
- 42m3-7/36 . . Combined merging and sorting
- 42m3-7/38 . . Methods or arrangements for performing computations, e.g. arithmetic unit (conversion of radix 42m3-5/02)
- 42m3-7/385 . . for addition or subtraction (42m3-7/40 to 42m3-7/56 take precedence)
- 42m3-7/39 . . for multiplication or division (42m3-7/40 to 42m3-7/56 take precedence)
- 42m3-7/395 . . . using column-shifting
- 42m3-7/40 . . using contact-making devices, e.g. electromagnetic relay (42m3-7/46 takes precedence)
- 42m3-7/42 . . . Adding; Subtracting
- 42m3-7/44 . . . Multiplying; Dividing
- 42m3-7/46 . . using electromechanical counter-type accumulators
- 42m3-7/48 . . using non-contact-making devices, e.g. tube, solid state device (42m3-7/56 takes precedence)
- 42m3-7/50 . . . Adding; Subtracting
- 42m3-7/52 . . . Multiplying; Dividing
- 42m3-7/54 using column-shifting
- 42m3-7/56 . . using electro-optical devices
- 42m3-9/00 Arrangements for programme control, e.g. control unit** (in regulating or control systems 42r1)
- 42m3-9/02 . using wired connections, e.g. plugboard
- 42m3-9/04 . using record carriers containing only programme instructions (42m3-9/06 takes precedence)
- 42m3-9/06 . using stored programme, i.e. using internal store of processing equipment to receive and retain programme
- 42m3-9/08 . . Single-address programming (42m3-9/18, 42m3-9/20 take precedence)
- 42m3-9/10 . . Multiple-address programming (42m3-9/18, 42m3-9/20 take precedence)
- 42m3-9/12 . . Sub-routine arrangements
- 42m3-9/14 . . . Wired-in micro-programmes
- 42m3-9/16 . . . Stored micro-programmes
- 42m3-9/18 . . Handling two or more programmes simultaneously or with time-sharing, e.g. priority arrangement, programme-interrupting arrangement
- 42m3-9/19 . . . with provision for programme modification, e.g. as a result of time-shared operation
- 42m3-9/20 . . with provision for address modifications
- 42m3-11/00 Error detection; Error correction; Monitoring** (marginal checking 21e; methods or arrangements for verifying the correctness of marking on a record carrier 42m6-5/00; in data transmission systems 21a1-36/24, 21a1-36/26)
- 42m3-11/02 . by computation, i.e. performing a computation of which the result is known, e.g. nines check
- 42m3-11/04 . by check programme, e.g. diagnostic routine
- 42m3-11/06 . by providing signals indicative of the functioning of the machine, e.g. whistling whilst multiplying
- 42m3-11/08 . by redundancy check
- 42m3-11/10 . . Adding special bits or symbols to the coded information, e.g. parity check, casting out nines or elevens
- 42m3-11/12 . . using self-checking codes
- 42m3-13/00 Interconnection of storage devices with the functional units of the data-processing equipment**
- 42m3-13/02 . the storage device being of the transit-time type, e.g. delay line
- 42m3-13/04 . the storage device requiring relative movement with respect to the recording or sensing element
- 42m3-13/06 . the storage device being a random-access store

42m3-13/08 . . . being a magnetic store

42m3-15/00 Data-processing equipment characterised by the combination of functions covered by group 42m3-7/00 and at least one other main group

Note:

Inventions to be classified in the subgroups of 42m3-15/00 are classified both in groups 42m3-15/02 to 42m3-15/18 and also in groups 42m3-15/20 to 42m3-15/58 so far as each of these sets of groups is relevant to the invention.

- 42m3-15/02 . . manually operated with input through keyboard and computation using a built-in programme, e.g. desk calculator
- 42m3-15/04 . . programmed simultaneously with the introduction of data to be processed, e.g. on the same record carrier
- 42m3-15/06 . . with a store which receives a complete set of programme steps before the individual data to be processed are introduced
- 42m3-15/08 . . . using a plugboard for programming
- 42m3-15/10 Tabulators
- 42m3-15/12 having provision for both printed and punched output
- 42m3-15/14 Calculating-punches
- 42m3-15/16 . . 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
- 42m3-15/18 . . in which a programme is changed according to experience gained by the computer itself during a complete run; Learning machines (adaptive control systems 42r1-13/00)
- 42m3-15/20 . . characterised by a specific application so far as the design or construction of the computing part is concerned
- 42m3-15/22 . . . for invoicing
- 42m3-15/24 . . . for inventory purposes; for order filling
- 42m3-15/26 for seat reservation
- 42m3-15/28 . . . for betting on the outcome of an event, e.g. a race, an election; Totalisators
- 42m3-15/30 . . . for bank or analogous accounting; for calculating earned income
- 42m3-15/32 . . . for solving equations
- 42m3-15/34 . . . for synthesis or analysis of complex mathematical functions, e.g. Fourier analysis, computing or correlation functions
- 42m3-15/36 . . . for evaluating statistical data
- 42m3-15/38 . . . for language translation
- 42m3-15/40 . . . for information retrieval; for compiling abstracts
- 42m3-15/42 . . . for medical purposes; for biological purposes
- 42m3-15/44 . . . for game playing
- 42m3-15/46 . . . for process control, e.g. quality or quantity control
- 42m3-15/48 . . . for traffic control
- 42m3-15/50 . . . for guiding a vehicle or missile along a prescribed course, e.g. carried on vehicle or missile
- 42m3-15/52 . . . for computing processes in nuclear physics or nuclear engineering
- 42m3-15/54 . . . for meteorology, e.g. for weather prediction
- 42m3-15/56 . . . for distribution networks, e.g. electrical network
- 42m3-15/58 . . . for gunlaying; for bomb aiming

42m4 (IPC: G06G) Analogue computers

42m4-1/00 Hand-manipulated computing devices (planimeters 42c)

- 42m4-1/02 . . Devices in which computing is effected by adding, subtracting, or comparing lengths of parallel or concentric graduated scales
- 42m4-1/04 . . . characterised by construction (42m4-1/10 takes precedence)
- 42m4-1/06 with rectilinear scales, e.g. slide rule
- 42m4-1/08 with circular or helical scales
- 42m4-1/10 . . . characterised by the graduation
- 42m4-1/12 logarithmic graduations, e.g. for multiplication

42m4-1/14	. in which a straight or curved line has to be drawn from given points on one or more input scales to one or more points on a result scale
42m4-1/16	. in which a straight or curved line has to be drawn through related points on one or more families of curves
42m4-3/00	Devices in which the computing operation is performed mechanically (42m4-1/00 takes precedence)
42m4-3/02	. for performing additions or subtractions, e.g. differential gearing
42m4-3/04	. for performing multiplications or divisions, e.g. variable-ratio gearing
42m4-3/06	. for evaluating functions by using cams and cam followers
42m4-3/08	. for integrating or differentiating, e.g. by wheel and disc
42m4-3/10	. for simulating specific processes, systems, or devices
42m4-5/00	Devices in which the computing operation is performed by means of fluid-pressure elements (such elements in general 60b)
42m4-7/00	Devices in which the computing operation is performed by varying electric or magnetic quantities
42m4-7/02	. Details not covered by 42m4-7/04 to 42m4-7/10
42m4-7/04	. input or output devices (graphs readers 42m6-11/00; function plotters, co-ordinate plotters 42m6-15/22)
42m4-7/06	. Programming arrangements, e.g. plugboard for interconnecting functional units of the computer
42m4-7/10	. Power supply arrangements
42m4-7/12	. Arrangements for performing computing operations, e.g. operational amplifier (amplifiers in general 21a2-18)
42m4-7/14	. . for addition or subtraction (of vector quantities 42m4-7/22)
42m4-7/16	. . for multiplication or division
42m4-7/18	. . for integration or differentiation; for forming intervals
42m4-7/19	. . . for forming Fourier integrals; for forming Laplace integrals; for forming correlation integrals
42m4-7/20	. . for evaluating powers, roots
42m4-7/22	. . for evaluating trigonometric functions; for conversion of co-ordinates; for computations involving vector quantities (trigonometric computations using simultaneous equations 42m4-7/34)
42m4-7/24	. . for evaluating logarithmic or exponential functions, e.g. hyperbolic functions
42m4-7/26	. . Arbitrary function generators
42m4-7/28	. . for synthesising functions by piecewise approximation
42m4-7/30	. . for interpolation or extrapolation
42m4-7/32	. . for solving of equations
42m4-7/34	. . . of simultaneous equations
42m4-7/36	. . . of single equations of quadratic or higher degree (42m4-7/22, 42m4-7/24 take precedence)
42m4-7/38	. . . of differential or integral equations
42m4-7/40	. . . . of partial differential equations (simulating specific devices 42m4-7/48)
42m4-7/42	. . . . . using electrolytic tank
42m4-7/44	. . . . . using continuous medium, current-sensitive paper
42m4-7/46	. . . . . using discontinuous medium, e.g. resistance network
42m4-7/48	. simulating for specific processes, systems or devices
42m4-7/50	. . for distribution networks, e.g. for fluids (42m4-7/62 takes precedence)
42m4-7/52	. . for economic systems; for statistics
42m4-7/54	. . for nuclear reactors; for nuclear power plant; radioactive fallout
42m4-7/56	. . for heat flow (42m4-7/58 takes precedence)
42m4-7/57	. . for fluid flow (42m4-7/50 takes precedence)
42m4-7/58	. . for chemical processes (42m4-7/74 takes precedence)
42m4-7/60	. . for living beings, e.g. their nervous systems
42m4-7/62	. . for electric systems or apparatus, e.g. supply or distribution network, motor
42m4-7/64	. . for non-electric machines, e.g. turbine
42m4-7/66	. . for control systems
42m4-7/68	. . for civil-engineering structures, e.g. beam, strut, girder
42m4-7/70	. . for vehicles, e.g. to determine permissible loading of ships

42m4-7/72	. . . Flight simulator (link trainers 62a5-7/00)
42m4-7/74	. . for colour or gas component analysis
42m4-7/76	. . for traffic
42m4-7/78	. . for direction-finding, locating, distance or velocity measuring, or navigation systems
42m4-7/80	. . for gun laying; for bomb aiming
42m4-9/00	Devices in which mathematical operations are carried out with the aid of optical or electro-optical elements (optical elements per se 42h-38; electro-optical elements per se 21g-39/00)
42m5	(IPC: G06J) Hybrid computing arrangements (analogue/digital conversion or vice versa 21a1-36/00)

Note:

A hybrid computing arrangement is one in which part of the computation is digital and part is analogue.

42m5-1/00	Hybrid computing arrangements (digitally-programmed analogue computers 42m4-7/06)
42m5-1/02	. Digital-differential analysers
42m5-3/00	Systems for conjoint operation of complete digital and complete analogue computers
42m6	(IPC: G06K) Recognition of data; Presentation of data; Record carriers; Handling record carriers (postal sorting 43a5, 81e)

Note:

This subclass covers marking, sensing, and conveying of record carriers, recognising characters and other data, and presenting visually or otherwise the data recognised or the result of a computation.

42m6-1/00	Methods or arrangements for marking the record carrier in digital fashion (interpreting 42m6-3/02)
42m6-1/02	. by punching (punching in general 49)
42m6-1/04	. . controlled by sensing markings on the record carrier being punched (sensing of record carriers 42m6-7/00)
42m6-1/05	. . High-speed punches, e.g. controlled by electric computer
42m6-1/06	. . Manually-controlled devices
42m6-1/08	. . . Card punches
42m6-1/10	. . . Tape punches (specially adapted for a particular purpose, see the relevant subclass, e.g. for telegraphy 21a1-8)
42m6-1/12	. otherwise than by punching (printing in general 15, e.g. 15g)
42m6-1/14	. by transferring data from a similar or dissimilar record carrier
42m6-1/16	. . by reproducing data from one punched card on to one or more punched cards without the code representation, i.e. duplicating
42m6-1/18	. . by transferring data from one type of record carrier on to another type of record carrier, e.g. from magnetic tape to punched card
42m6-1/20	. Simultaneous marking of record carrier and printing-out of data, e.g. printing-punch
42m6-1/22	. . Simultaneous marking and printing on different record carriers, e.g. on different types of record carrier
42m6-3/00	Methods or arrangements for printing of data in the shape of alphanumeric or other characters from a record carrier, e.g. interpreting, printing-out from a magnetic tape
42m6-3/02	. Translating markings on a record carrier into printed data on the same record carrier, i.e. interpreting
42m6-5/00	Methods or arrangements for verifying the correctness of markings on a record carrier; Column-detection devices
42m6-5/02	. the verifying forming a part of the marking action

- 42m6-5/04 . verifying the alignment of markings
- 42m6-7/00 Methods or arrangements for sensing record carriers (42m6-9/00 takes precedence)**
- 42m6-7/01 . Details
- 42m6-7/015 . . Aligning or centring of the sensing device with respect to the record carrier (in general 42t1)
- 42m6-7/016 . . Synchronisation of sensing process (in general 42t1)
- 42m6-7/02 . by pneumatic or hydraulic means, e.g. sensing punched holes with compressed air; by sonic means
- 42m6-7/04 . by mechanical means, e.g. by pins operating electric contacts
- 42m6-7/06 . by means which conduct current when a mark is sensed or absent, e.g. contact brush or pin for punched hole, contact brush for a conductive mark
- 42m6-7/08 . by means detecting the change of an electrostatic or magnetic field, e.g. by detecting change of capacitance between electrodes
- 42m6-7/10 . by electromagnetic radiation, e.g. optical sensing; by corpuscular radiation
- 42m6-7/12 . . using a selected wavelength, e.g. to sense red marks and ignore blue marks
- 42m6-7/14 . . using light without selection of wavelength, e.g. sensing reflected white light
- 42m6-9/00 Methods or arrangements for reading or recognising printed or written characters or geometric figures**
- 42m6-9/02 . Details
- 42m6-9/04 . . Aligning or centring sensing device relative to the character carriers
- 42m6-9/06 . . Circuitry, e.g. logic circuits for identifying one out of sixty-four possible characters
- 42m6-9/08 . using reference characters, e.g. superimposed on the image of characters to be read or compared
- 42m6-9/10 . using dissection of the character area
- 42m6-9/12 . . using two-dimensional dissection, e.g. by rastering, by a mosaic arrangement of the scanned elements
- 42m6-9/13 . . using a slot moved over the character to be recognised and thereby obtaining a waveform the instantaneous amplitude of which corresponds to the degree of blackness of the part of the character under the slot at that instant
- 42m6-9/14 . using testing probes (42m6-9/10 takes precedence)
- 42m6-9/16 . using contour-following means, e.g. cathode ray
- 42m6-9/18 . using printed characters having additional code marks or containing code marks, e.g. the character being composed of individual strokes of different shape, each representing a different code value
- 42m6-11/00 Methods or arrangements for graph-reading (combined with character recognition 42m6-9/16)**
- 42m6-11/02 . Curve followers
- 42m6-13/00 Conveying record carriers from one station to another, e.g. from stack to punching position**
- 42m6-13/02 . the record carrier having longitudinal dimension comparable with transverse dimension, e.g. punched card
- 42m6-13/04 . . Details, e.g. flaps in card-sorting apparatus
- 42m6-13/05 . . . Capstans; Pinch rollers
- 42m6-13/06 . . Guiding cards; Checking absence, presence, or correct position of cards
- 42m6-13/07 . . Transporting of cards between stations, e.g. intermittently
- 42m6-13/08 . . Feeding or discharging cards
- 42m6-13/10 . . . from magazine to conveying arrangement
- 42m6-13/12 . . . from conveying arrangement to magazine
- 42m6-13/14 . . . Card magazines, e.g. pocket, hopper (card magazines in general 11e)
- 42m6-13/16 . . Handling flexible sheets, e.g. cheque
- 42m6-13/18 . the record carrier being longitudinally extended, e.g. punched or magnetic tape (features of interest apart from data processing 42t1)
- 42m6-13/20 . . Details
- 42m6-13/22 . . . Capstans; Pinch rollers
- 42m6-13/24 . . Guiding of record carriers; Recognising end of record carrier
- 42m6-13/26 . . Winding-up or unwinding of record carriers; Driving of record carriers

42m6-15/00	Arrangements for the visual presentation of the output data (marking record carriers 42m6-1/00; in general 15, 21a1, 42h, 57e)
42m6-15/02	. involving the printing of alphanumeric characters
42m6-15/04	. . by rack-type printers
42m6-15/06	. . by type-wheel printers
42m6-15/08	. . by rotating-disc printers, e.g. by flight-printing by chain printers
42m6-15/10	. . by matrix printers
42m6-15/12	. . by photographic printing
42m6-15/14	. . by electrographic printing, e.g. xerography; by magnetographic printing
42m6-15/16	. . Means for paper feeding or form feeding
42m6-15/18	. Arrangements giving a visual indication without printing characters
42m6-15/20	. . with transitory presentation on cathode ray tube, e.g. analogue display unit
42m6-15/22	. . Producing permanent record, e.g. on graph paper (recording measured values 42d)
42m6-17/00	Methods or arrangements for effecting co-operative working between equipments covered by two or more of the preceding main groups, e.g. automatic card files incorporating conveying and reading operations
42m6-19/00	Record carriers for use with machines and with at least a part designed to carry digital markings (record carriers adapted for controlling specific machines, see the appropriate subclass for the machine, e.g. 51d, 49m, 86b, 21a1; form printing 15; file cards 11e; record carriers in general 42t)
42m6-19/02	. characterised by the selection of materials, e.g. to avoid wear during transport through the machine
42m6-19/04	. characterised by the shape
42m6-19/06	. characterised by the kind of the digital marking, e.g. shape, nature
42m6-19/08	. . using markings of different kinds in the same record carrier, e.g. one marking being sensed by optical and the other by magnetic means
42m6-21/00	Punched cards for information retrieval designed for manual use or handling by machine (42m6-19/00 takes precedence); Apparatus for handling such cards
42m6-21/02	. in which coincidence of markings is sensed mechanically, e.g. by needle
42m6-21/04	. in which coincidence of markings is sensed optically, e.g. peek-a-boo system
42m6-21/06	. Apparatus or tools adapted for slotting or otherwise marking information-retrieval cards (tools for perforating in general 49c, 54d-3)
42m7	(IPC: G06M) Counting mechanisms; counting of objects not otherwise provided for (counting by measuring volume or weight of articles to be counted 42e, 42f; computers 42m1 to 42m5; counting electric pulses 21a1-36/22)

Note:**This subclass deals with:****(a) stepping or continuously-moving mechanical counters operated through one or more inputs applied to the lowest order mechanically or electrically;****(b) counting systems involving applications of either mechanical, electrical, or electronic counters.**

42m7-1/00	Design features of general application
42m7-1/02	. Housing
42m7-1/04	. for driving the stage of lowest order (with variable ratio of drive 42m7-1/38)
42m7-1/06	. . producing continuous revolution of the stage, e.g. with gear train
42m7-1/08	. for actuating the drive
42m7-1/10	. . by electric or magnetic means
42m7-1/12	. . by fluid means
42m7-1/14	. for transferring a condition from one stage to a higher stage (with variable ratio of transfer 42m7-1/38)

- 42m7-1/16 . . self-operating, e.g. by Geneva mechanism
- 42m7-1/18 . . requiring external operation, e.g. by electromagnetic force
- 42m7-1/20 . . specially adapted for denominations with unequal numbers in each stage, e.g. degrees and minutes of angle
- 42m7-1/22 . for visual indication of the result of count on counting mechanisms, e.g. by window with magnifying lens
- 42m7-1/24 . . Drums; Dials; Pointers (for measuring instruments in general 42d)
- 42m7-1/26 . . Aligning means
- 42m7-1/27 . for representing the result of count in the form of electric signals, e.g. by sensing markings on the counter drum
- 42m7-1/272 . . using photoelectric means
- 42m7-1/274 . . using magnetic means; using Hall-effect devices
- 42m7-1/276 . . using mechanically-actuated contacts
- 42m7-1/28 . for zeroising or setting to a particular value
- 42m7-1/30 . . using heart-shaped or similar cams; using levers
- 42m7-1/32 . . . Actuating means, e.g. magnet, spring, weight
- 42m7-1/34 . . using reset shafts
- 42m7-1/36 . . . Actuating means, e.g. magnet, spring, weight
- 42m7-1/38 . for varying ratio of drive or transfer mechanism, e.g. by using alternative counting trains

42m7-3/00 Counters with additional facilities (generating electric pulses at random intervals 21a1-36/00)

- 42m7-3/02 . for performing an operation at a predetermined value of the count, e.g. arresting a machine
- 42m7-3/04 . . with an additional counter train operating in the reverse direction
- 42m7-3/06 . for printing or separately displaying result of count (display systems 74)
- 42m7-3/08 . for counting the input from several sources; for counting inputs of different amounts
- 42m7-3/10 . for counting denominations with unequal numbers in each stage, e.g. degrees and minutes of angle (transfer mechanism therefor 42m7-1/20)
- 42m7-3/12 . for preventing incorrect actuation, e.g. for preventing falsification
- 42m7-3/14 . for registering difference of positive and negative actuations

Counting of objects (in machines for shaping metal without removing material 7b-51/00; in printing machines or presses 15d-13/20, 15d-54/01, 15e-9/15; in office copying machines 15i; of axles of rail vehicles 20i-41/30; in packaging machines 81a; of objects conveyed through a pipe or tube 81e-156)

42m7-7/00 Counting of objects carried by a conveyer

- 42m7-7/02 . wherein objects ahead of the sensing element are separated to produce a distinct gap between successive objects
- 42m7-7/04 . . Counting of piece goods, e.g. of boxes
- 42m7-7/06 . . Counting of flat articles, e.g. of sheets of paper
- 42m7-7/08 . wherein the direction of movement of the objects is changed at the station where they are sensed
- 42m7-7/10 . . Counting of flat overlapped articles, e.g. of cards

42m7-9/00 Counting of objects in a stack thereof

- 42m7-9/02 . by using a rotating separator incorporating pneumatic suction nozzles

42m7-11/00 Counting of objects distributed at random, e.g. on a surface

- 42m7-11/02 . using an electron beam scanning a surface line by line, e.g. of blood cells on a substrate
- 42m7-11/04 . . with provision for distinguishing between different sizes of objects (investigating particle size in general 42i-13/04)

42n Teaching and demonstration aids (for dental surgeons 30b, 21; for music 51e, 1-6; for aeronautics 62c-27/03); perpetual calendars (calendars utilisable for one year only 11e-6; perpetual calendars for use as card files 11e-28; calendar clocks and automatically shifting calendars with automatic adjustment of the length of the months)

83a-78); synoptic tables, coding and decoding devices (on typewriters 15g-20)**Teaching and demonstration aids**

- 42n-1 for reading (for reading and arithmetics 42n-5)
- 42n-2/01 for writing (for Braille 42n-2/02, for typewriting 42n-6/05)
- 42n-2/02 for blind persons (typewriters for blind persons 15g-19, writing devices for blind persons)
- 42n-3 for computing, with counting members on parallel rods
- 42n-4 for computing, miscellaneous
- 42n-5 for reading and computing
- 42n-6/01 for kindergartens
- 42n-6/02 for drawing (drawing instruments 42a)
- 42n-6/03 for languages
- 42n-6/04 for history
- 42n-6/05 for typewriting
- 42n-6/06 for bookkeeping
- 42n-6/07 for military instruction
- 42n-6/09 for traffic matters
- 42n-6/10 for handicrafts

- Teaching and demonstration aids for astronomy
- 42n-7/01 Planetariums and tellurons
- 42n-7/02 Astrological and related devices
- 42n-7/03 World time indicators (clocks 83a)
- 42n-7/04 Star charts (celestial globes 42n-8/02 – 42n-8/04)

- Teaching and demonstration aids for geography
- 42n-8/01 Miscellaneous teaching and demonstration aids for geography (globes 42n-8/02 – 42n-8/04; land maps 42n-9/01 – 42n-9/06)
- 42n-8/02 Globes in general
- 42n-8/03 Collapsible globes
- 42n-8/04 Inflatable globes
- 42n-9/01 Maps in general
- 42n-9/02 Folding and collapsible maps
- 42n-9/03 Maps on strips (moved by means of a vehicle 42p-11/02, 42p-11/50)
- 42n-9/04 Relief maps, stereo graphic (plane maps with relief effects 75d-14, 75d-15; manufacture of printing plates for the production of relief maps 15b-5; 57d-1/07)
- 42n-9/05 Locating devices for maps (54g-2/02)
- 42n-9/06 Containers for maps (map pockets 33d-8/05; map holders 34i-9/20, 34i-9/21)

- Teaching and demonstration aids for mathematics, and natural sciences
- 42n-10/01 for anatomy, also for sports
- 42n-10/02 for botany, zoology, mineralogy, geology (means of conservation of natural-science collections 45I-1 45I-1/00 – 45I-3/03)
- 42n-11/01 for mechanics and acoustics
- 42n-11/02 for optics
- 42n-11/03 for magnetism and electricity
- 42n-11/04 for chemistry
- 42n-11/05 for mathematics
- 42n-11/06 Experimenting boxes
- 42n-11/50 Teaching and demonstration aids for purposes not mentioned before

Perpetual calendars, synoptic tables, coding and decoding devices

Perpetual calendars

- 42n-12/01 with interchangeable or folding date holders
- 42n-12/02 with date holders slidable along a straight line
- 42n-12/03 with devices for marking a specific date
- 42n-12/04 with strip-like date holders
- 42n-12/05 with cylindrical date holders
- 42n-12/06 with disk-like date holders
- 42n-12/07 Shifting calendars without automatic adjustment of the length of the months
- 42n-13/01 Travel time tables
- 42n-13/02 Schedules, broadcasting programs
- 42n-13/03 Miscellaneous synoptic tables
- 42n-14 Coding and decoding devices (on typewriters 15g-20)

42o**Speed measuring devices**

- 42o-1 Speed measuring devices with pumps
- 42o-2/01 Speed measuring devices with dynamos
- 42o-2/05 Eddy current speed measuring devices
- 42o-3 Speed measuring devices with friction gearing and comparison timer
- 42o-4 Speed measuring devices with intermittently coupled pointers
- 42o-5 Speed measuring devices with centrifugal weights
- 42o-6 Speed measuring devices with impacted oscillating system
- 42o-7 Speed measuring devices with centrifugally adjusted liquid mirrors
- 42o-8 Speed measurement through direct determination of the time and distance
- 42o-9 Logs
- 42o-10 Recording speed measuring devices
- 42o-11 Speed measuring devices with electric contacts
- 42o-12 Speed indicating and limiting devices (46c3-27; 63c-68; 63d-19)
- 42o-13/01 Measuring devices for average speeds (42d-4)
- 42o-13/02 Stroboscopic speed measuring devices (42h-37; 57a-36)
- 42o-13/03 Angular velocity measuring devices
- 42o-13/04 Rate of climb or descent measuring devices
- 42o-13/05 Comparison of the numbers of revolutions of several shafts
- 42o-13/06 Acoustic speed measuring devices
- 42o-13/07 Speed measurement by means of electromagnetic radiation
- 42o-13/08 Speed measurement by means of the terrestrial magnetic field
- 42o-13/10 Miscellaneous speed measuring devices
- 42o-14 Friction speed measuring devices (42o-1)
- 42o-15 Flow velocity measuring devices, especially for the measurement of the relative speed of aircraft (42c-27; 42e-23; 42k-5; 42o-9)
- 42o-16 Resonance speed measuring devices (21e-7)
- 42o-17 Devices for the measurement of degree of irregularity, acceleration meters, speed measuring devices based on the principle of acceleration and distance meters therefor (42g-8/07)
- 42o-18 Speed measuring devices with sighting arrangements, especially for the determination of the absolute speed of aircraft
- 42o-19 Speed measuring devices and devices for the measurement of very high speeds, time measuring devices therefor, photographic speed measuring devices
- 42o-20 Driving mechanisms for speed measuring devices (63c-68)

- 42p** **Counting devices, distance measuring devices, fare indicating devices, fare recorders** (adders 42m-1 – 42m-9; 43a-13/04)
- 42p-1 Roller counting mechanisms
- 42p-2 Disk counting mechanisms
- 42p-3 Electric connection for counting mechanisms (42o-11; 43a-5; electricity meters 21e-14 – 21e-22; telephone registers 21a3-75 – 21a3-77; remote indicating devices 74b-9)
- 42p-4 Mechanical shifting devices for counting mechanisms (42m-22; 43a-13/05)
- 42p-5/01 Counting mechanisms for loads and parcels, e.g. barrels, sacks, rolls, buttons (pill counters 30g-6/03; money-counting apparatus 43a-18; counting devices on packing machines 81a-1 – 81a-16)
- 42p-5/50 Counting devices for moving loads (20i-41; 20i-27/04)
- 42p-6 Counting mechanisms for turnstiles
- 42p-7 Counting mechanisms for measuring rules and the like
- 42p-8 Counting mechanisms for doors, stairs, drawers, boxes and the like (45h-17/03, 45h-31/02)
- 42p-9/01 Counting mechanisms for various purposes (8f-4; 30a-4/08; 57a-32/06)
- 42p-9/02 Counting mechanisms for work-producing machines (52a-58/10; numbering machines 15h-6)
- 42p-9/03 Counting mechanisms for fluid-delivery devices (42e-20; 42p-10/02; 64c-11; 64c-30)
- 42p-10/01 Details of counting mechanisms (printing mechanisms for consumption meters 43a-14)
- 42p-10/02 Mechanisms for carrying of tens (42m-17 – 42m-19; 43a-13/04)
- 42p-10/03 Zero-setting devices (42m-20; 43a-13/04), also in connection with printing mechanisms
- 42p-10/10 Automatic triggering of a process, e.g. signal transmission, stopping of a machine after reaching a certain number
- 42p-11/01 Devices for the measurement of distances
- 42p-11/02 Drives connected to vehicle wheels or to universal drive shafts
- 42p-11/50 Location indicators to indicate distances traversed without indication of direction (42c-9/02; 42c-34; 42c-39/10; station indicators 20i-25 – 20i-27)
- 42p-12/01 Fare indicator (taximeters)
- 42p-12/10 Special design of the flag
- 42p-12/50 Fare indicator with receipt-printing mechanism (travel ticket printing devices 15h-5; ticket-dispensing devices 43a-20)
- 42p-12/60 Fare indicator started by seat or access obstruction
- 42p-13/01 Fare registers driven directly by the vehicle (43a-42/01)
- 42p-13/10 Fare registers with oscillating elements
- 42q** **Automatic regulators, including program control devices for physical state values, i.e. pressure, temperature, density, of general application** (nonelectric regulators for any control-led condition 42r; electric regulating devices 21c-46/50 – 21c-46/54; regulators for special engineering purposes in special classes; mixing valves 47g-20/02; quantity regulators 42e-23/55)
- Pressure regulators**
- 42q-1/10 without auxiliary power
- 42q-1/20 with auxiliary power
- Temperature regulators**
- 42q-2/01 with solid expanding bodies
- 42q-2/02 with liquid or gaseous expanding bodies; bellows pistons
- 42q-2/03 with bimetal temperature sensors
- 42q-2/04 with snap-mechanism

42q-2/05 with electric temperature sensors (thermoelements, resistance thermometers)
 42q-2/06 with mercury tilting switches
 42q-2/07 with liquid-contact thermometers
 42q-2/08 with specially designed temperature sensors, e.g. fusible elements, elements with temperature responsive permeability

Special temperature regulators

42q-3/01 with delay
 42q-3/02 with resetting, successive contacts
 42q-3/03 for coarse and fine adjustment
 42q-3/04 allowing for the time derivative
 42q-3/05 with step-by-step regulation
 42q-3/06 with auxiliary power, in particular pneumatic control
 42q-3/07 with auxiliary thermostats or auxiliary heating

42q-4 Density regulators

42q-5 Regulators in combination with indicating or recording apparatus

42q-6 Program control regulators

42r Automatic non-electric regulators for any controlled conditions and for general application (electric regulating devices 21c-46/50 – 21c-46/54; regulators for special engineering purposes in special classes)

42r-1/01 without feedback

42r-1/02 with feedback

42r-1/03 with auxiliary power, in particular pneumatic control

42r-1/04 with auxiliary thermostats or auxiliary heating

42r-2/01 with delay

42r-2/02 for coarse and fine adjustment

42r-2/03 allowing for the time derivative

42r-2/04 with step-by-step regulation

42r-3 Program control regulators

42r-4 Auxiliary devices for regulators, such as servomotors and power amplifiers (servomotors for general use and servomotor circuits 60-30, 60-35)

42r-5 Regulators with more than one actuating or adjusting device

42r1 (IPC: G05B) Control or regulating systems in general; Functional elements of such systems; Monitoring or testing arrangements for such systems or elements (fluid-pressure actuators or systems acting by means of fluids in general 60a; valves in general 47g1; characterised by mechanical features only 42r4; sensitive elements, see the appropriate subclasses, e.g. 47i, 21, 42; correcting units, see the appropriate subclasses, e.g. 21d)

Notes:

Applications of control systems or elements for regulating specific variables are covered by subclasses 42r2, 42r3, and not by this subclass. However, features of such systems or elements which are clearly more generally applicable are classified in this subclass.

In this subclass:

(1) The term "automatic controller" means a system, circuit, or device in which a signal from the detecting element is compared with a signal representing the desired value and which operates in such a way as to reduce the deviation. The automatic controller generally does not include the sensitive element, i.e. that element which measures the value

of the condition to be corrected, or the correcting element, i.e. that element which adjusts the condition to be corrected.

(2) The term "electric" is intended to include "electromechanical", "electrohydraulic", and "electropneumatic".

(3) Details of specific control systems are classified in the group relevant to the system, if not otherwise provided for.

42r1-1/00	Comparing elements, i.e. elements for effecting comparison directly or indirectly between a desired value and existing or anticipated values
42r1-1/01	. electric
42r1-1/04	. . with sensing of the position of the pointer of a measuring instrument
42r1-1/06	. . . continuous sensing
42r1-1/08	. . . stepwise sensing
42r1-1/10	. pneumatic only
42r1-1/12	. hydraulic only
42r1-5/00	Anti-hunting arrangements
42r1-5/01	. electric
42r1-5/03	. pneumatic only
42r1-5/05	. hydraulic only
42r1-6/00	Internal feedback arrangements for obtaining particular characteristics, e.g. proportional, integral, differential (in automatic controllers 42r1-11/00)
42r1-6/02	. electric
42r1-6/04	. pneumatic only
42r1-6/06	. hydraulic only
42r1-7/00	Arrangements for obtaining smooth engagement or disengagement of automatic control
42r1-7/02	. electric
42r1-7/04	. pneumatic
42r1-9/00	Safety arrangements (42r1-7/00 takes precedence; safety valves 47g1-17/00; emergency protective circuit arrangements in general 21c)
42r1-9/02	. electric
42r1-9/04	. pneumatic only
42r1-9/06	. hydraulic only
42r1-11/00	Automatic controllers (42r1-13/00 takes precedence)
42r1-11/01	. electric
42r1-11/06	. . in which the output signal represents a continuous function of the deviation from the desired value, i.e. continuous controllers (42r1-11/26 takes precedence)
42r1-11/10	. . . the signal transmitted being dc
42r1-11/12	. . . the signal transmitted being modulated on an ac carrier
42r1-11/14	. . in which the output signal represents a discontinuous function of the deviation from the desired value, i.e. discontinuous controllers (42r1-11/26 takes precedence)
42r1-11/16	. . . Two-step controllers, e.g. with on/off action
42r1-11/18	. . . Multi-step controllers
42r1-11/26	. . in which the output signal is a pulse-train
42r1-11/28	. . . using pulse-height modulation; using pulse-width modulation
42r1-11/30	. . . using pulse-frequency modulation
42r1-11/32	. . with inputs from more than one sensing element; with outputs to more than one correcting element
42r1-11/36	. . with provision for obtaining particular characteristics, e.g. proportional, integral, differential
42r1-11/38	. . . for obtaining a proportional characteristic
42r1-11/40	. . . for obtaining an integral characteristic
42r1-11/42	. . . for obtaining a characteristic which is both proportional and time-dependent, e.g. PI, PID
42r1-11/44	. pneumatic only
42r1-11/46	. . without auxiliary power

42r1-11/48	. . with auxiliary power
42r1-11/50	. . . in which the output signal represents a continuous function of the deviation from the desired value, i.e. continuous controllers
42r1-11/52	. . . in which the output signal represents a discontinuous function of the deviation from the desired value, i.e. discontinuous controllers
42r1-11/54	. . . . Two-step controllers, e.g. with on/off action
42r1-11/56	. . . . Multi-step controllers
42r1-11/58	. . with inputs from more than one sensing element; with outputs to more than one correcting element
42r1-11/60	. hydraulic only
42r1-13/00	Adaptive control systems, i.e. systems automatically adjusting themselves to have a performance which is optimum according to some preassigned criterion (details of the computer 42m3-15/18)
42r1-13/02	. electric
42r1-15/00	Systems controlled by a computer (42r1-13/00 take precedence; automatic controllers with particular characteristics 42r1-11/00; computers per se 42m)
42r1-15/02	. electric
42r1-17/00	Systems involving the use of models or simulators of said systems (42r1-13/00, 42r1-15/00 take precedence; analogue computers for simulating specific processes, systems or devices, 42m4-7/48)
42r1-17/02	. electric
42r1-19/00	Programme-control systems (42r1-13/00, 42r1-15/00, 42r1-17/00 take precedence, specific applications, see the relevant subclasses, e.g. 34c-15/46; clocks or clock mechanisms with attached or built-in means operating any device at a preselected time interval 74a, 83a, 83b; marking or sensing record carriers with digital information 42m6; information storage 42t; time or time-programme switches 21c-43, 21c-44)
42r1-19/02	. electric
42r1-19/04	. . Programme-control other than numerical, i.e. with the programme-storing device delivering other than numerical signals
42r1-19/06	. . . using cams, discs, rods, drums, or the like (mechanical programme-control apparatus 42r4-21/00)
42r1-19/08	. . . using plugboards, cross-bar distributors, matrix switches, or the like
42r1-19/10	. . . using selector switches
42r1-19/12	. . . using record carriers
42r1-19/14	. . . . using punched cards or tapes
42r1-19/16	. . . . using magnetic record carriers
42r1-19/18	. . Numerical programme-control, i.e. with the programme-storing device delivering numerical signals
42r1-19/20	. . . using incremental-digital measuring or comparing devices
42r1-19/22	. . . . in which an incremental-comparing device delivers coincidence signals, e.g. for point-to point control
42r1-19/24	. . . . in which an incremental-comparing device delivers signals continuously to a regulating device, e.g. for continuous-path control
42r1-19/26	. . . using absolute-digital measuring or comparing devices
42r1-19/28	. . . . in which a digital-comparing device delivers coincidence signals, e.g. for point-to point control
42r1-19/30	. . . . in which a digital-comparing device delivers signals continuously to a regulating device, e.g. for continuous-path control
42r1-19/32	. . . using analogue measuring or comparing devices
42r1-19/34	. . . . in which an analogue-comparing device delivers coincidence signals, e.g. for point-to point control
42r1-19/36	. . . . in which an analogue-comparing device delivers signals continuously to a regulating device, e.g. for continuous-path control
42r1-19/38	. . . using a combination of the means covered by at least two of the preceding subgroups 42r1-19/20, 42r1-19/26, and 42r1-19/32

42r1-19/40	. . . Numerical programme control not using a measuring device, e.g. using stepping motor
42r1-19/42	. . Recording and playback systems, i.e. in which the programme is recorded from a cycle of operations, e.g. the cycle of operations being manually controlled, after which this record is played back on the same machine
42r1-19/44	. pneumatic only
42r1-21/00	Systems involving sampling of the variable controlled (42r1-13/00 to 42r1-19/00 take precedence; signal transmission systems per se 74b, 74c; electronic switching or gating per se 21a1-36/18)
42r1-21/02	. electric
42r1-22/00	Systems not provided for in the previous groups
42r1-22/02	. electric
42r1-22/04	. pneumatic
42r1-23/00	Testing or monitoring of control systems or parts thereof
42r1-23/02	. Electric testing or monitoring
42r2	(IPC: G05D) Systems for controlling or regulating non-electric variables (valves in general 47g1; for regulating electric or magnetic variables 42r3)

Notes:

1. This subclass comprises only (a) systems for regulation of non-electric variables and (b) systems for control of non-electric variables and involving comparison between the actual and desired values of the variables to be controlled.
2. The term "systems" in this subclass includes self-contained devices such as speed governors, pressure regulators.
3. Features of general applicability to regulating systems, e.g. anti-hunting arrangements, are classified in subclass 42r1.
4. Control systems designed specifically for particular apparatus, machines, or processes are normally classified in the subclasses for the apparatus, machines, or processes.

42r2-1/00	Control of position, course, or attitude of land, water, air, or space vehicles, e.g. automatic pilot (construction or disposition of steering means on land vehicles 63, on waterborne vessels 65f2; manual or automatic control of aircraft, e.g. using automatic pilot or radiated signals, 62b-14)
42r2-1/02	. Control of position or course according to a horizontal frame of co-ordinates
42r2-1/03	. . using near-field transmission systems, e.g. inductive-loop type
42r2-1/04	. Control of altitude or depth
42r2-1/06	. . Rate of change of altitude or depth
42r2-1/08	. Control of attitude, i.e. control of roll, pitch, or yaw
42r2-1/10	. Simultaneous control of position or course in three dimensions (42r2-1/12 takes precedence)
42r2-1/12	. Target-seeking control
42r2-3/00	Control of position or direction (42r2-1/00 takes precedence)
42r2-3/02	. of light beam or spot (structural association of search light with its directing gear 4b-11)
42r2-3/04	. of a member relative to a body being worked on or tested by the member (controlling machine tools 49m; testing arrangements in general 42)
42r2-3/06	. of moving web or strip (of conveyers 81e)
42r2-3/08	. of bodies moving along a fixed track (on conveyers 81e)
42r2-5/00	Control of dimensions of material
42r2-5/02	. of thickness, e.g. of rolled material (of specific materials 7a, 32a, 39a2, 55d)
42r2-5/03	. . characterised by the use of electric means
42r2-5/04	. of the size of items, e.g. of particles

42r2-5/06	. . . characterised by the use of electric means
42r2-7/00	Control of flow (level control 42r2-9/00; ratio control 42r2-11/00; weighing apparatus 42f)
42r2-7/01	. . without auxiliary power
42r2-7/03	. . with auxiliary power
42r2-7/06	. . characterised by the use of electric means
42r2-9/00	Level control, e.g. controlling quantity of material stored in vessel (controlling level of liquid-pool electrode in electric discharge tubes and lamps 21f-82, 21g-14)
42r2-9/02	. . without auxiliary power
42r2-9/04	. . with auxiliary power
42r2-9/12	. . characterised by the use of electric means
42r2-11/00	Ratio control (humidity control 42r2-22/00)
42r2-11/02	. . Controlling ratio of two or more flows of fluid or fluent material
42r2-11/03	. . . without auxiliary power
42r2-11/035	. . . with auxiliary power
42r2-11/04	. . . . by sensing weight of individual components, e.g. gravimetric procedure
42r2-11/06	. . . . by sensing density of mixture, e.g. using aerometer
42r2-11/08	. . . . by sensing concentration of mixture, e.g. measuring pH-value
42r2-11/10	. . . . . by sensing moisture of non-aqueous liquids
42r2-11/12	. . . . by sensing viscosity of mixture
42r2-11/13	. . . characterised by the use of electric means
42r2-11/16	. . Controlling mixing ratio of fluids having different temperatures, e.g. by sensing the temperature of a mixture of fluids having different viscosities
42r2-13/00	Control of linear speed; Control of angular speed; Control of acceleration or deceleration, e.g. of a prime mover (of dynamo-electric machines 21d; synchronising telegraph receiver and transmitter 21a1-13)
42r2-13/02	. . Details
42r2-13/04	. . . providing for emergency tripping of an engine in case of exceeding maximum speed
42r2-13/06	. . . providing for damping of erratic vibrations in governors
42r2-13/08	. . without auxiliary power
42r2-13/10	. . Centrifugal governors with fly-weights
42r2-13/12	. . . Details
42r2-13/14	. . . . Fly-weights; Mountings thereof; Adjusting equipment for limits, e.g. temporarily
42r2-13/16	. . . . Risers; Transmission gear therefor; Restoring mechanisms therefor
42r2-13/18	. . . counterbalanced by spider springs acting immediately upon the fly-weights
42r2-13/20	. . . counterbalanced by spider springs acting upon the articulated riser
42r2-13/22	. . . counterbalanced by fluid pressure acting upon the articulated riser
42r2-13/24	. . . counterbalanced by two or more different appliances acting simultaneously upon the riser, e.g. with both spring force and fluid pressure, with both spring force and electromagnetic force
42r2-13/26	. . . with provision for modulating the degree of non-uniformity of speed
42r2-13/28	. . . with provision for performing braking effects in case of increased speed
42r2-13/30	. . Governors characterised by fluid features in which the speed of a shaft is converted into fluid pressure (transducers converting variations of physical quantities into fluid-pressure variations 60a-5/00)
42r2-13/32	. . . using a pump
42r2-13/34	. . with auxiliary power (fluid-pressure converters 60a-3/00)
42r2-13/36	. . using regulating devices with proportional band, i.e. P regulating devices
42r2-13/38	. . . involving centrifugal governors of fly-weight type
42r2-13/40	. . . involving fluid governors of pump type
42r2-13/42	. . . involving fluid governors of flow-controller type, i.e. the width of liquid flow being controlled by fly-weights
42r2-13/44	. . . involving fluid governors of jet type
42r2-13/46	. . using regulating devices with proportional band and integral action, i.e. PI regulating devices

42r2-13/48	. . . involving resilient restoring mechanisms
42r2-13/50	. . . involving connecting means for superimposing a proportional regulating device and an integral regulating device
42r2-13/52	. . using regulating devices with proportional band and derivative action, i.e. PD regulating devices
42r2-13/54	. . . involving centrifugal governors of fly-weight type exerting an acceleratory effect
42r2-13/56	. . . involving restoring mechanisms exerting a delay effect
42r2-13/58	. . . involving means for connecting a speed-regulating device and an acceleration-regulating device
42r2-13/60	. . using regulating devices with proportional band, derivative, and integral action, i.e. PID regulating devices
42r2-13/62	. characterised by the use of electric means, e.g. use of a tachometric dynamo, use of a transducer converting an electric value into a displacement
42r2-13/64	. Compensating the speed difference between engines meshing by a differential gearing or the speed difference between a controlling shaft and a controlled shaft
42r2-13/66	. Governor units providing for co-operation with control dependent upon a variable other than speed
42r2-15/00	Control of mechanical force or stress; Control of mechanical pressure
42r2-15/01	. characterised by the use of electric means
42r2-16/00	Control of fluid pressure (control of pressure in electric discharge tubes or lamps 21f-82, 21g-12 – 21g-14; control of pressure in electric incandescent lamps 21f-42)
42r2-16/02	. Modifications to reduce the effects of instability, e.g. due to vibrations, friction, abnormal temperature, overloading, unbalance (vibration-dampers 47a3-7/00)
42r2-16/04	. without auxiliary power
42r2-16/06	. . the sensing element being a flexible member yielding to pressure, e.g. diaphragm, bellows, capsule
42r2-16/08	. . . Control of liquid pressure
42r2-16/10	. . the sensing element being a piston or plunger
42r2-16/12	. . the sensing element being a float
42r2-16/14	. with auxiliary power
42r2-16/16	. . derived from the controlled fluid
42r2-16/18	. . derived from an external source
42r2-16/20	. characterised by the use of electric means
42r2-17/00	Control of torque; Control of mechanical power
42r2-17/02	. characterised by the use of electric means
42r2-19/00	Control of mechanical oscillations, e.g. of amplitude, of frequency, of phase (generating or transmitting mechanical vibrations 42s; control of electric motors 21d)
42r2-19/02	. characterised by the use of electric means
42r2-21/00	Control of chemical or physico-chemical variables, e.g. pH-value (by control of ratio 42r2-11/00)
42r2-21/02	. characterised by the use of electric means
42r2-22/00	Control of humidity (air conditioning 36d)
42r2-22/02	. characterised by the use of electric means
42r2-23/00	Control of temperature (automatic switching arrangements for electric heating apparatus 21h-13; controlling induction heating 21h-18; regulating temperature of anode of X-ray tube 21g-20)
42r2-23/01	. without auxiliary power
42r2-23/02	. . with sensing element expanding and contracting in response to changes of temperature (42r2-23/13 takes precedence)
42r2-23/08	. . . with bimetallic element (valve arrangements adapted for mixing 47g1-19/00)
42r2-23/10	. . . with snap-action elements (for valves 47g1-31/56)
42r2-23/12	. . with sensing element responsive to pressure or volume changes in a confined fluid

42r2-23/13	. . by varying the mixing ratio of two fluids having different temperatures
42r2-23/185	. with auxiliary power
42r2-23/19	. characterised by the use of electric means
42r2-23/20	. . with sensing elements having variation of electric or magnetic properties with change of temperature (42r2-23/13 takes precedence)
42r2-23/22	. . . the sensing element being a thermocouple
42r2-23/24	. . . the sensing element having a resistance varying with temperature, e.g. thermistor
42r2-23/26	. . . the sensing element having a permeability varying with temperature
42r2-23/27	. . with sensing element responsive to radiation
42r2-23/275	. . with sensing element expanding, contracting, or fusing in response to changes of temperature
42r2-23/30	. . Automatic controllers with an auxiliary heating device affecting the sensing element, e.g. for anticipating change of temperature (automatic controllers in general and not restricted to control of temperature 42r1)
42r2-23/32	. . with provision for adjustment of the effect of the auxiliary heating device, e.g. as a function of time
42r2-24/00	Control of viscosity
42r2-24/02	. characterised by the use of electric means
42r2-25/00	Control of light intensity (controlling light beam 42r2-3/02; light modulating devices 21g-4/07; circuit arrangements for controlling light sources 21f-62 – 21f-67, 21f-84)
42r2-25/02	. characterised by the use of electric means
42r2-27/00	Simultaneous control of variables covered by two or more of the preceding main groups
42r2-27/02	. characterised by the use of electric means
42r2-29/00	Simultaneous control of electric and non-electric variables
42r3	(IPC: G05F) Systems for regulating electric or magnetic variables (regulating the timing or recurrence frequency of pulses in radar or radio navigation systems 21a4-48; closed-loop systems for regulating non-electric variables by electric means 42r2; regulating current supply in networks 21c-67/50 – 21c-67/70; regulating the charging of batteries 21c-50, 21c-51; regulating motor current 21c-57, 21c-58; regulating frequency response, gain, maximum output, amplitude, or bandwidth of amplifiers 21a2-18, 21a4-35; regulating tuning of resonant circuits 21a4-69, 21a4-70; regulating characteristics of transmission lines 21a2-36; regulating operating characteristics of X-ray tubes 21g-20/05)
	Notes:
	1. This subclass includes the use of hydraulic, pneumatic, mechanical, and electrical motors for varying electric characteristics of devices which restore the quantity regulated.
	2. This subclass is restricted to systems, the elements per se being in the relevant subclasses.
	3. The regulation of the output of generators, converters, or transformers is dealt with in 21c, 63, 64 and 67.
42r3-1/00	Automatic systems in which deviations of an electric quantity from one or more predetermined values are detected at the output of the system and fed back to a device within the system to restore the detected quantity to its predetermined value or values, i.e. retroactive systems
42r3-1/02	. regulating electric characteristics of arcs (arrangements for feeding electrodes 21f-25)
42r3-1/04	. . by means of saturable magnetic devices
42r3-1/06	. . by means of discharge tubes

42r3-1/08	. . . by means of semiconductor devices
42r3-1/10	. Regulating voltage or current (42r3-1/02 takes precedence)
42r3-1/12	. . . wherein the variable is ac
42r3-1/14	. . . . using tap transformers or variable inductors as final control devices
42r3-1/16	. . . . . combined with discharge tubes or semiconductor devices
42r3-1/18	. . . . . discharge tubes only
42r3-1/20	. . . . . semiconductor devices only
42r3-1/22	. . . . . combined with separate magnetic control devices having a controllable degree of saturation
42r3-1/24	. . . . using bucking or boosting transformers as final control devices
42r3-1/26	. . . . . combined with discharge tubes or semiconductor devices
42r3-1/28	. . . . . discharge tubes only
42r3-1/30	. . . . . semiconductor devices only
42r3-1/32	. . . . using magnetic devices having a controllable degree of saturation as final control devices
42r3-1/34	. . . . . combined with discharge tubes or semiconductor devices
42r3-1/36	. . . . . discharge tubes only
42r3-1/38	. . . . . semiconductor devices only
42r3-1/40	. . . . using discharge tubes as final control devices; using semiconductor devices as final control devices
42r3-1/42	. . . . . discharge tubes only
42r3-1/44	. . . . . semiconductor devices only
42r3-1/46	. . . wherein the variables is dc
42r3-1/48	. . . . using variable impedances as final control devices
42r3-1/50	. . . . . in series with the load
42r3-1/52	. . . . . being discharge tubes
42r3-1/54	. . . . . additionally controlled by the unregulated supply
42r3-1/56	. . . . . being semiconductor devices
42r3-1/58	. . . . . combined with overload protection; combined with temperature compensation
42r3-1/60	. . . . . in parallel with the load
42r3-1/62	. . . . using bucking or boosting dc sources
42r3-1/64	. . . wherein the variable is dc and there is conversion between the unregulated supply and the regulated output to the load (regulating converters 21d2-53, 21d2-54)
42r3-1/66	. Regulating electric power
42r3-1/68	. Regulating power factor; Regulating reactive current
42r3-3/00	Non-retroactive systems for regulating electric variables by using an uncontrolled elements having self-regulating properties
42r3-3/02	. Regulating voltage or current
42r3-3/04	. . . wherein the variable is ac
42r3-3/06	. . . . using combinations of saturated and unsaturated inductive devices, e g. combined with resonant circuit
42r3-3/08	. . . wherein the variable is dc
42r3-3/10	. . . . using non-linear resistors
42r3-3/12	. . . . . glow discharge tubes
42r3-3/14	. . . . . zener diodes; uncontrolled semiconductor devices
42r3-5/00	Systems for regulating electric variables by detecting deviations in the electric input to the system and thereby controlling a device within the system to obtain a regulated output
42r3-7/00	Regulating magnetic variables

42r4 (IPC: G05G) Control devices or systems insofar as characterised by mechanical features only ("Bowden" or like mechanisms 47b-1/10; gearings or mechanisms not peculiar to this purpose 47h; systems peculiar to the control of particular machines or apparatus classified in a single other class, see the class for such machines or apparatus)

Note:

This subclass covers members of general applicability for mechanical control, and mechanical systems for moving members to one or more definite settings.

- 42r4-1/00 Controlling members; Assemblies or arrangements thereof; Indicating position of controlling members** (means for holding or locking them in position 42r4-5/00; specially for programme control 42r4-21/00; steering wheels for motor vehicles 63c; handle-bars for cycles 63h; for steering ships 65; for valves 47g1-33/60)
- 42r4-1/02 . Knobs or the like for actuation by pushing, pulling, or sliding movement; Assemblies thereof, e.g. keyboard (42r4-1/10 takes precedence)
- 42r4-1/04 . Levers for actuation by swinging movement (42r4-9/12 takes precedence); Assemblies thereof, e.g. keyboard
- 42r4-1/06 . . Details of their grip parts (42r4-1/10 takes precedence)
- 42r4-1/08 . Rotatable controlling members, e.g. hand wheel; Assemblies thereof
- 42r4-1/10 . . Details of the members themselves, e.g. of disc, knob, wheel, handle
- 42r4-1/12 . . . Means for securing the members on rotatable spindles or the like
- 42r4-1/14 . Controlling members for foot-actuation, e.g. pedal; Foot rests or foot guides
- 42r4-1/16 . . Non-slip treads therefor; Pedal extension or like attachments
- 42r4-1/18 . . Foot rests or foot guides, not on the pedal
- 42r4-1/20 . Controlling members specially adapted for actuation by other parts of the human body than hand or foot
- 42r4-1/22 . Controlling members specially adapted for actuation by keys, screwdrivers, or other tools
- 42r4-1/24 . Arrangements of a number of controlling members with respect to one another
- 42r4-3/00 Controlled members, e.g. gear-shifter yoke; Assemblies or arrangements thereof (interlocking of controlled members 42r4-5/08)**
- 42r4-5/00 Means for preventing or limiting movement of parts of a control mechanism, e.g. locking controlling member** (42r4-17/00 takes precedence; preventing actuation of speed-changing or reversing mechanism in unfavourable conditions 47h-57/06)
- 42r4-5/02 . Means preventing undesired movements of a controlling member which can be moved in two or more separate steps or ways, e.g. restricting to a stepwise movement or to a particular sequence of movements
- 42r4-5/04 . Stops for limiting movement of members, e.g. adjustable stop
- 42r4-5/06 . for holding members in one or a limited number of definite positions only
- 42r4-5/08 . . Interlocking of members, e.g. locking a member in a particular position before or during the movement of another member
- 42r4-5/10 . . . the members being the shifter members of a gear-box
- 42r4-5/12 . for holding members in an indefinite number of positions, e.g. by a toothed quadrant
- 42r4-5/14 . . by locking a member with respect to a fixed quadrant, rod, or the like
- 42r4-5/16 . . . by friction
- 42r4-5/18 . . . by positive interengagement, e.g. by a pawl
- 42r4-5/20 . . by locking a quadrant, rod, or the like carried by the member
- 42r4-5/22 . . . by friction
- 42r4-5/24 . . . by positive interengagement, e.g. by a pawl
- 42r4-5/26 . . by other means than a quadrant, rod, or the like
- 42r4-5/30 . Retarding mechanisms
- 42r4-5/40 . Cocking mechanisms (for special applications in special classes, e.g. firearms 72a-25/06)

42r4-5/50	. Toggle mechanisms (for special applications in special classes, e.g. electrical circuit breakers 21c-28/02)
42r4-7/00	Manually-actuated control mechanisms provided with one single controlling member co-operating with one single controlled member; Details thereof (controlling members 42r4-1/00)
42r4-7/02	. characterised by special provisions for conveying or converting motion, or for acting at a distance
42r4-7/04	. . altering the ratio of motion or force between controlling member and controlled member as a function of the position of the controlling member
42r4-7/06	. . in which repeated movement of the controlling member produces increments of movement of the controlled member (42r4-7/08 takes precedence)
42r4-7/08	. . in which repeated movement of the controlling member moves the controlled member through a cycle of distinct positions
42r4-7/10	. . specially adapted for remote control (42r4-7/04 to 42r4-7/08 take precedence)
42r4-7/12	. specially adapted for actuating a member on a system in motion with respect to the controlling member, e.g. on a rotating shaft (adjustable cranks or eccentrics 47b-3/28)
42r4-7/14	. characterised by the use of a retarding mechanism, e.g. an inertia-responsive time-delay device
42r4-7/16	. Special provisions for reducing the effect of slight relative movement between supports of the mechanism, e.g. resulting from resilient mounting of a controlled mechanism
42r4-9/00	Manually-actuated control mechanisms provided with one single controlling member co-operating with two or more controlled members, e.g. selectively, simultaneously
42r4-9/02	. the controlling member being movable in different independent ways, movement in each individual way actuating one controlled member only
42r4-9/04	. . in which movement in two or more ways can occur simultaneously
42r4-9/06	. the controlled members being actuated successively by repeated movement of the controlling member
42r4-9/08	. the controlled members being actuated successively by progressive movement of the controlling member
42r4-9/10	. with preselection and subsequent movement of each controlled member by movement of the controlling member in two different ways, e.g. guided by a shift gate
42r4-9/12	. . for shifting change-speed gearings
42r4-9/14	. . . the controlling shift lever directly engaging the shift members, e.g. the shifter yoke
42r4-9/16	. . . with a linkage, outside the gear housing, between shift lever and shift members
42r4-9/18	. . . . with a single linkage for both preselection and shifting
42r4-11/00	Manually-actuated control mechanisms provided with two or more controlling members co-operating with one single controlled member
42r4-13/00	Manually-actuated control mechanisms provided with two or more controlling members and also two or more controlled members (interlocking 42r4-5/08)
42r4-13/02	. with separate controlling members for preselection and shifting of controlled members
42r4-13/04	. . for change-speed gearings
42r4-15/00	Mechanical devices for initiating a movement automatically due to a specific cause (automatic clutches 47c-43/00; automatic control of gearings 47h, e.g. 47h-5/40; stopping machines in case a body part of a person is in a danger zone 47a4-3/12; stopping machines on occurrence of dangerous conditions therein 47a4-7/02; forming part of electric switches, time switches 21c)
42r4-15/02	. due to alteration of the sense of movement of a member
42r4-15/04	. due to distance or angle travelled by a member

42r4-15/06	. due to the speed of rotation or of bodily movement of a member, e.g. passing an upper or lower limit thereof (speedometers 42o)
42r4-15/08	. due to the load or torque on a member, e.g. if exceeding a predetermined value thereof
42r4-17/00	Mechanical devices for moving a member after being released; Trip or release mechanisms characterised thereby
42r4-19/00	Servo-mechanisms with follow-up action, e.g. occurring in steps
42r4-21/00	Mechanical apparatus for control of a series of operations, i.e. programme control, e.g. involving a set of cams (42r4-5/02 takes precedence)
42r4-23/00	Means for ensuring the correct positioning of parts of control mechanisms, e.g. for taking-up play
42r4-23/02	. self-adjusting
42r4-25/00	Other details or appurtenances of control mechanisms, e.g. supporting intermediate members elastically
42s	Devices and methods for the generation of mechanical oscillations, performing engineering work by means of oscillations, oscillating systems for general purposes, also ultrasound generators (cf. oscillation generators in pertinent classes)
42s	(No subdivision)
42s	(IPC: B06B) Methods and apparatus for generating and/or transmitting mechanical vibrations of infrasonic, sonic or ultrasonic frequency for performing mechanical work in general (measurement and analysis of mechanical vibrations 42c-42, 42g-1; in direction finding, locating, distance and velocity measuring 74d-6/12 – 74d-6/16, 42c-30/01, 42o-13/06; generation of electrical oscillations 21a1-9/02, 21a4-1 – 21a4-13, 21d2-5/50; electromechanical transducers 42t-1, 21a2-1 – 21a2-16/04, 21a2-17, 21a4-10, 42g-5, 42g-10/01, 42k-14/04)
42s-1/00	Methods and apparatus for generating mechanical vibrations of infrasonic, sonic, or ultrasonic frequency
42s-1/02	. making use of electrical energy (42s-1/18, 42s-1/20 take precedence)
42s-1/04	. . operating with electromagnetism (vibratory electromagnetic motors per se 21d1-21 – 21d1-23)
42s-1/06	. . operating with electrostriction or with piezo-electric effect (piezo-electric devices 21a2-8, 21a4-10, 42k-14/04)
42s-1/08	. . operating with magnetostriction (magnetostrictive devices 21a2-1/04)
42s-1/10	. making use of mechanical energy (42s-1/18, 42s-1/20 take precedence)
42s-1/12	. . operating with systems involving reciprocating masses
42s-1/14	. . . the masses being elastically coupled
42s-1/16	. . operating with systems involving rotary unbalanced masses
42s-1/18	. wherein the vibrator is actuated by pressure fluid (42s-1/20 takes precedence)
42s-1/20	. making use of a vibrating fluid (whistles or sirens per se 74d-1, 74d-2)
42s-3/00	Methods or apparatus specially adapted for transmitting mechanical vibrations of infrasonic, sonic, or ultrasonic frequency
42s-3/02	. involving a change of amplitude
42s-3/04	. involving focusing or reflecting
42t1	(IPC: G11B) Information storage based on relative movement between record carrier and transducer (recording measured values

in a way that does not require playback through a transducer 42d; photochemical processing of recordings 57b; recording or playback apparatus capable only of dealing with binary digits 42m6; circuits for coupling output of reproducer to radio receiver 21a4-25, 21a4-26; electromechanical transducers and circuits therefor 42g)

Notes:

1. This subclass deals with the recording and playback of information by relative movement between a record track and a transducer, the transducer directly producing, or being directly actuated by, modulation in the track being recorded or played-back, and the extent of modulation corresponding to the signal being recorded or played-back.

2. This subclass includes

(a) apparatus and machines for recording or playback, and parts thereof;
(b) record carriers for use with such apparatus and machines;
(c) associated working of other apparatus with such apparatus and machines

3. In this subclass:

(a) The term "head" includes any means for converting sinusoidal or non-sinusoidal electric wave-forms into variations of the physical condition of at least the adjacent surface of the record carrier, or vice versa.

(b) A record carrier is understood to be a body, such as a cylinder, disc, card, tape, or wire, capable of permanently holding information, which can be read-off by a sensing element movable relatively to the recorded information.

42t1-1/00	Cabinets; Cases; Stands; Disposition of apparatus therein or thereon (furniture aspects 34i, e.g. 34i-81/06)
42t1-1/02	. modified to store record carriers
42t1-1/04	. combined with other apparatus having a different main function
42t1-3/00	Recording information by cutting, deforming, or pressing grooves, e.g. by stylus; Record carriers therefor; Reproducing from such record carriers by mechanical sensing of the grooves
42t1-3/02	. Arrangements of heads (styli 42t1-3/44)
42t1-3/04	. . Multiple, convertible, or alternative transducing arrangements
42t1-3/06	. . Determining or indicating position of head
42t1-3/08	. . Raising, lowering, traversing otherwise than for transducing, arresting, or holding-up heads and record carriers relatively to one another
42t1-3/10	. . Arranging, supporting, or driving of heads or of transducers relatively to record carriers
42t1-3/12	. . . Supporting in balanced, counterbalanced, or loaded operative position, e.g. loading in direction of traverse
42t1-3/14	. . . . by using effects of gravity or inertia, e.g. counterweight
42t1-3/16	. . . . . adjustable
42t1-3/18	. . . . . Damping by using viscosity effect
42t1-3/20	. . . . . by elastic means, e.g. spring
42t1-3/22	. . . . . adjustable
42t1-3/24	. . . . . acting to decrease pressure on record
42t1-3/26	. . . . . acting to increase pressure on record
42t1-3/28	. . . . . providing transverse bias parallel to record
42t1-3/30	. . . Supporting in an operative position
42t1-3/32	. . . . Construction or arrangement of support pillars
42t1-3/34	. . . Driving; Guiding
42t1-3/36	. . . . Automatic-feed mechanisms producing progressive transducing traverse across record carriers otherwise than by grooves, e.g. by lead-screw

- 42t1-3/38 Guiding, e.g. constructions or arrangements providing linear or other special tracking characteristics
- 42t1-3/40 Driving of heads relatively to stationary record carriers for transducing
- 42t1-3/42 . . . with provision for adaptation or interchange of heads
- 42t1-3/44 . Styli, e.g. sapphire, diamond
- 42t1-3/46 . . Constructions or forms, e.g. attachment of point to shank
- 42t1-3/48 . . . Needles
- 42t1-3/50 . . Anvils or other supports opposing stylus forces
- 42t1-3/52 . . Arrangements permitting styli to yield under excessive pressure
- 42t1-3/54 . . Storing; Manipulating, e.g. feeding styli to and from heads
- 42t1-3/56 . . Sharpening
- 42t1-3/58 . . Cleaning record carriers or styli, e.g. removing shavings or dust (brushes 9b)
- 42t1-3/60 . . Turntables for record carriers (forming rotor of dynamo-electric motor 21d)
- 42t1-3/62 . . Locating record carriers on turntables, e.g. adaptor for enabling centre-pin to receive carriers with large centre hole, e.g. repeatably
- 42t1-3/64 . Re-recording, i.e. transcribing information from one grooved record carrier on to one or more similar or dissimilar record carriers
- 42t1-3/66 . Erasing information, e.g. for reuse of record carrier
- 42t1-3/68 . Record carriers (characterised by direction of groove relative to head 42t1-25/00)
- 42t1-3/70 . . characterised by the selection of material or structure; Processes or apparatus specially adapted for manufacturing record carriers (processes involving a single technical art and for which provision exists elsewhere, see the relevant class, e.g. 39a)
- 42t1-3/72 . . Groove formations, e.g. run-in groove, run-out groove
- 42t1-3/74 . . . Multiple output tracks, e.g. binaural stereophonic
- 42t1-3/76 . . . forming part of cinematograph films
- 42t1-3/78 . . Multiple-track arrangements
- 42t1-3/80 . . incorporating subsidiary guide means for heads, other than modulated grooves; Part-formed unmodulated grooves for conversion into transducing grooves
- 42t1-3/82 . . Visual features of record carriers
- 42t1-3/84 . . . Printed matter, e.g. design, label, photograph
- 42t1-3/86 . . . for indexing; for speed controlling, e.g. stroboscopic markings
- 42t1-3/88 . . . for display simultaneously with reproduction
- 42t1-3/90 . . with means indicating prior or unauthorised use
- 42t1-5/00 Recording information by magnetisation of a record carrier; Record carriers therefor; Reproducing therefrom by using magnetic means (by optical means 42t1-11/10)**
- 42t1-5/02 . . Recording, reproducing, and/or erasing methods (42t1-5/12 takes precedence)
- 42t1-5/04 . . Frequency-modulation recording
- 42t1-5/06 . . Pulse-modulation recording
- 42t1-5/08 . . Boundary-displacement recording
- 42t1-5/10 . Housings for heads
- 42t1-5/12 . Structures of inductive heads
- 42t1-5/14 . . with cores composed of particles, e.g. with dust core, with ferrite core
- 42t1-5/16 . . with cores being composed of metal sheets, i.e. laminated cores
- 42t1-5/18 . . . with tape-wound cores
- 42t1-5/20 . . Construction or disposition of windings
- 42t1-5/22 . . Structure of the surface of the head in physical contact with, or immediately adjacent to, the recording medium, i.e. pole pieces
- 42t1-5/24 . . . having one gap
- 42t1-5/26 . . . having more than one gap for erasing, recording, and/or reproducing on the same track
- 42t1-5/28 . . Structural combination of unitary heads for more than one track
- 42t1-5/30 . Structures of flux-sensitive heads
- 42t1-5/32 . . using irradiation or particle bombardment, e.g. reproducing by detecting a reflected electron beam
- 42t1-5/34 . . with saturated jig, e.g. for detecting second harmonic, balanced-flux head
- 42t1-5/36 . . having vibrating elements
- 42t1-5/38 . . using Hall devices
- 42t1-5/40 . Protective measures on heads, e.g. against excessive temperature

- 42t1-5/42 . Apparatus or processes specially adapted for the manufacture of heads, e.g. assembly
- 42t1-5/44 . Circuitry for obtaining a desired electric performance of the head, e.g. with equaliser incorporated in the head (avoiding accidental operation of head 42t1-15/04; head switching 42t1-15/12)
- 42t1-5/46 . Arrangements for functional testing of heads; Measuring arrangements for heads; Arrangements for demagnetisation of heads (measuring electric or magnetic properties 21e; demagnetisation in general 21g-5)
- 42t1-5/48 . Dispositions or mounting of heads relative to record carriers
- 42t1-5/50 . . Interchangeable mountings, e.g. for replacement of head without readjustment
- 42t1-5/52 . . with simultaneous movement of head and record carrier, e.g. rotation of head
- 42t1-5/54 . . with provision for moving the head of its operative position
- 42t1-5/56 . . with provision for adjustment of the relative positions of head and record carriers, e.g. manual adjustment
- 42t1-5/58 . . Maintaining relative alignment of the heads and record carriers, e.g. to compensate for surface irregularities of the latter
- 42t1-5/60 . . . Pneumodynamic or hydrodynamic spacing of heads from record carriers
- 42t1-5/62 . Record carriers characterised by the selection of the material
- 42t1-5/64 . . comprising only the magnetisable material without bonding agent
- 42t1-5/66 . . . consisting of several layers
- 42t1-5/68 . . comprising one or more layers of magnetisable particles homogeneously mixed with a bonding agent
- 42t1-5/70 . . . on a base layer
- 42t1-5/72 . . Protective coatings, e.g. anti-static, anti-friction
- 42t1-5/74 . Record carriers characterised by the form, e.g. sheet shaped to wrap around a drum
- 42t1-5/76 . . Drum carriers
- 42t1-5/78 . . Tape carriers
- 42t1-5/80 . . Card carriers
- 42t1-5/82 . . Disc carriers
- 42t1-5/84 . Processes or apparatus specially adapted for manufacturing record carriers (processes involving a single technical art and for which provision exists elsewhere, see the relevant class, e.g. 39a)
- 42t1-5/86 . Re-recording, i.e. transcribing information from one magnetisable record carrier on to one or more similar or dissimilar record carriers

- 42t1-7/00 Recording information on a record carrier by optical means; Record carriers therefor; Reproducing such recorded information by optical means**
- 42t1-7/02 . using electromagnetic radiation other than visible light
- 42t1-7/04 . using fluorescent or phosphorescent record carriers
- 42t1-7/06 . using electrography
- 42t1-7/08 . Disposition or mounting of heads or light sources relatively to record carriers
- 42t1-7/10 . . Interchangeable mountings, e.g. for replacement of head without readjustment
- 42t1-7/12 . Heads
- 42t1-7/14 . . adapted to record on, or to reproduce from, more than one track simultaneously (42t1-7/20 takes precedence)
- 42t1-7/16 . . using filters, e.g. colour filter
- 42t1-7/18 . . using optical slits
- 42t1-7/20 . . Dual-recording arrangements, i.e. in which the information is recorded in two different forms simultaneously on the same or related tracks, e.g. recording instantaneous and mean values (sound-recording combined with cinematography 57a-68, 57a-69)
- 42t1-7/22 . . Apparatus or processes specially adapted for the manufacture of heads, e.g. assembly
- 42t1-7/24 . Record carriers characterised by the selection of the material or by the structure (for cinematography 39a3-17/00)
- 42t1-7/26 . . Apparatus or processes specially adapted for the manufacture of record carriers (processes involving a single technical art and for which provision exists elsewhere, see the relevant class, e.g. 39a3-17/00)
- 42t1-7/28 . Re-recording, i.e. transcribing information from one record carrier on to one or more similar or dissimilar record carriers using optical sensing and recording means

42t1-9/00	Recording information otherwise than by cutting grooves, by magnetisation, or by optical means; Record carriers therefor; Reproducing by using means other than styli, magnetic means, or optical means
42t1-9/02	. using ferroelectric record carriers; Record carriers therefor
42t1-9/04	. using record carriers having variable electric resistance; Record carriers therefor
42t1-9/06	. using record carriers having variable electrical capacitance; Record carriers therefor (42t1-9/02 takes precedence)
42t1-9/08	. using electrostatic charge injection; Record carriers therefor
42t1-11/00	Recording and reproducing wherein the reproducing method is covered by a different main group from that of the recording method; Record carriers therefor
42t1-11/02	. Recording by flame, jet, flowing fluid, or beam of particles
42t1-11/04	. . and reproducing by sensing magnetic properties
42t1-11/06	. . and reproducing by sensing grooves with styli
42t1-11/08	. Recording by electric charge or by variation of electric resistance or capacitance, e.g. reproducing by sensing optical properties
42t1-11/10	. Recording by magnetic means and reproducing by sensing optical properties
42t1-11/12	. Recording by influencing light-sensitive material
42t1-11/14	. . and reproducing by sensing magnetic properties
42t1-11/16	. Recording by styli, pens, or brushes
42t1-11/18	. . and reproducing by sensing optical properties
42t1-11/20	. . and reproducing by sensing magnetic properties
42t1-13/00	Recording simultaneously by methods covered by different main groups; Record carriers therefor; Reproducing simultaneously therefrom
42t1-13/02	. magnetically and by styli
42t1-13/04	. magnetically and optically
42t1-13/06	. optically and by styli
42t1-15/00	Driving, starting, stopping, or guiding record carriers of filamentary or web form; Control of operating function (driving or moving of heads 42t1-21/02)
42t1-15/02	. Control of operating function, e.g. switching from recording to reproducing
42t1-15/04	. . Preventing, inhibiting, or warning against accidental erasing or double recording
42t1-15/06	. . by sensing auxiliary features on record carriers, e.g. to stop machine near the end of a tape
42t1-15/08	. . . by photoelectric sensing
42t1-15/10	. . Manually-operated control; Solenoid-operated control
42t1-15/12	. . Masking of heads; Switching of heads between operative and inoperative functions; Masking of beams, e.g. of light beams
42t1-15/14	. . . Masking or switching periodically
42t1-15/16	. . by means responsive to presence or absence of record carrier
42t1-15/18	. Driving; Starting; Stopping; Arrangements for control or regulation thereof (handling tapes or filamentary material in general 47k)
42t1-15/20	. . Moving record carrier backwards or forwards by finite amounts, i.e. back-spacing, forward-spacing
42t1-15/22	. . Brakes; Automatic stopping devices (slowing-down preparatory to stopping or speed-changing 42t1-15/48; speed-controlling by mechanical linkage 42t1-15/50; brake constructions in general 47c)
42t1-15/24	. . Drive-disengaging means
42t1-15/26	. . Driving record carriers by members acting directly or indirectly thereon
42t1-15/28	. . . through rollers driving by frictional contact with the carrier, e.g. capstan; Multiple arrangements of capstans or drums coupled to means for controlling the speed of the drive; Multiple capstan systems alternately engageable with record carrier to provide reversal
42t1-15/29	. . . . through pinch-rollers
42t1-15/30	. . . through the means for supporting the record carrier, e.g. mandrel, turntable
42t1-15/32	. . . through the reels or cores on to which the record carrier is wound
42t1-15/34	. . . through non-slip drive means, e.g. sprocket

42t1-15/38	. . Driving record carriers by pneumatic means
42t1-15/40	. . Driving record carriers otherwise than by electric motor
42t1-15/42	. . . manually
42t1-15/43	. . Control or regulation of mechanical tension of record carrier, e.g. tape tension
42t1-15/44	. . Speed-changing arrangements; Reversing arrangements; Drive-transfer means therefor
42t1-15/46	. . Controlling, regulating, or indicating speed
42t1-15/48	. . . Starting; Accelerating; Decelerating; Arrangements preventing malfunction during drive change
42t1-15/50	. . . by mechanical linkage, e.g. clutch
42t1-15/52	. . . by using signals recorded on, or derived from, record carrier
42t1-15/54	. . . by stroboscope; by tachometer (speedometers or tachometers 42o)
42t1-15/56	. using reserve loops, e.g. to minimise inertia during acceleration
42t1-15/58	. . with vacuum column
42t1-15/60	. Guiding record carrier
42t1-15/62	. . Maintaining desired spacing between record carrier and head
42t1-15/64	. . . by pneumodynamic or hydrodynamic spacing
42t1-15/66	. . Threading; Loading; Automatic self-loading; Spools (reels in general 47k)
42t1-17/00	Automatic mechanisms for starting, driving, or stopping disc-type record carriers on turntables, for raising or lowering, positioning or traversing, arresting or holding-up transducers or record carriers relatively to each other, and for automatically transferring record carriers to and from transducing position
42t1-17/02	. Details
42t1-17/04	. . Feeding or guiding single records to or from playing unit
42t1-17/06	. . Automatic movement of tone-arm into, or out of, place for playing records, e.g. manually placed on playing unit
42t1-17/08	. from consecutive-access magazine of disc records
42t1-17/10	. . with horizontal transfer to the turntable from a stack arranged with a vertical axis
42t1-17/12	. . with axial transfer to the turntable from a stack with a vertical axis
42t1-17/14	. . . by mechanism in rotating centre post, e.g. permitting the playing of both sides of a record
42t1-17/16	. . . by mechanism in stationary centre post, e.g. with stepped post, using fingers on post
42t1-17/18	. . . by mechanism operating on the edge of the disc record
42t1-17/20	. . with transfer away from stack on turntable after playing
42t1-17/22	. from random-access magazine of disc records

Note:**Group 42t1-17/30 takes precedence over groups 42t1-17/24 to 42t1-17/28.**

42t1-17/24	. . the magazine having a toroidal or part-toroidal shape
42t1-17/26	. . the magazine having a cylindrical shape with vertical axis
42t1-17/28	. . the magazine having a cylindrical shape with horizontal axis
42t1-17/30	. . wherein the playing unit is moved accordingly to the location of the selected record

42t1-19/00 Driving, starting, stopping, or guiding of record carriers not specifically of filamentary or web form, or of supports therefor; Control thereof (42t1-17/00 takes precedence)

42t1-19/02	. Control of drive; Control of operating function, e.g. switching from recording to reproducing
42t1-19/04	. . Arrangements for preventing, inhibiting, or warning against, double recording on the same blank, or against other recording or reproducing malfunctions
42t1-19/06	. . by counting or timing of machine operations
42t1-19/08	. . by using devices external to the driving mechanisms, e.g. coin-freed switch
42t1-19/10	. . by sensing presence or absence of record in accessible stored position or on turntable
42t1-19/12	. . by sensing distinguishing features of records, e.g. diameter
42t1-19/14	. . by sensing movement or position of head, e.g. means moving in correspondence with head movements

42t1-19/16	. . Manual control
42t1-19/18	. . . Manual action on one element producing control effect indirectly by consequent action of driving mechanism
42t1-19/20	. Driving; Starting; Stopping
42t1-19/22	. . Brakes other than speed-regulating brakes (brake constructions in general 47c)
42t1-19/24	. . Arrangements for providing constant relative speed between record carrier and head
42t1-19/26	. . Speed-changing arrangements; Reversing arrangements
42t1-19/28	. . Speed controlling, regulating, or indicating (42t1-19/24 takes precedence; speedometers or tachometers 42o)
42t1-21/00	Head arrangements irrespective of the method of recording or reproducing
42t1-21/02	. Driving or moving of heads
42t1-21/04	. . Automatic feed mechanism producing progressive transducing traverse across the record carrier
42t1-21/06	. . . the record carrier having means to ensure traverse movement of the head
42t1-21/08	. . Track changing or selecting (42t1-21/12 takes precedence)
42t1-21/10	. . Track finding or aligning by moving the head
42t1-21/12	. . Raising and lowering; Back-spacing or forward-spacing along track; Returning to starting position
42t1-21/14	. . . manually
42t1-21/16	. Supporting the heads; Supporting the sockets for plug-in heads
42t1-21/18	. . while the head is moving
42t1-21/20	. . while the head is in operative position but stationary or permitting minor movements to follow irregularities in surface of record carrier
42t1-21/22	. . while the head is out of operative position
42t1-21/24	. . Head support adjustments
42t1-21/26	. . Means for interchange or replacement of head or head element
42t1-23/00	Record carriers irrespective of the method of recording; Accessories therefor, e.g. container
42t1-23/02	. Containers; Storing means
42t1-23/04	. . Magazines; Cassettes (42t1-23/12 takes precedence)
42t1-23/06	. . . for housing endless webs or filaments
42t1-23/08	. . . for housing end-to-end webs or filaments
42t1-23/10	. . . . on single reels or winding cores
42t1-23/12	. . Bins for random storage of webs or filaments
42t1-23/14	. Providing ability to repeat location, e.g. using sprocket holes
42t1-23/16	. Record carriers with single track for recording at spaced intervals along the track thereof, e.g. for speech or language training
42t1-23/18	. Record carriers with multiple tracks, e.g. with complementary and partial tracks such as paired "stereo" tracks
42t1-23/20	. with provision for splicing to provide permanent or temporary connections
42t1-23/22	. . of endless belts; of tapes forming Möbius loops
42t1-23/24	. . of tapes having multiple tracks parallel to edge of record carrier by offset splicing to form endless loop with one or more helical tracks
42t1-23/26	. . of leaders for loading or threading, e.g. to form a temporary connection
42t1-23/28	. indicating prior or unauthorised use
42t1-23/30	. with provision for auxiliary signals (sensing such signals 42t1-15/06)
42t1-23/32	. . Electrical or mechanical contacting means; Tape stop foils
42t1-23/34	. . Signal means additional to the main recording track, e.g. photoelectric sensing of sprocket holes for timing
42t1-23/36	. . Signals on record carriers or on containers and recorded by the same method as the main recording
42t1-23/38	. Visual features other than those contained in record tracks or represented by sprocket holes
42t1-23/40	. . Identifying or analogous means applied to, or incorporated in, the record carrier and not intended for visual display simultaneously with the playing-back of the record carrier, e.g. label, leader, photograph
42t1-23/42	. . Marks for indexing, speed-controlling, synchronising, or timing

42t1-23/44	. . Information for display simultaneously with playback of the record, e.g. photographic matter
42t1-23/46	. . . Cinematograph films with integral tracks, e.g. with sound track
42t1-23/48	. . . Diascopic slides with integral sound or other tracks on, or adjacent to, the picture area or on the mounting means
42t1-25/00	Apparatus characterised by the shape of record carrier employed but irrespective of the method of recording (individual parts of apparatus 42t1-1/00 to 42t1-23/00)
42t1-25/02	. using cylindrical record carriers
42t1-25/04	. using flat record carriers, e.g. disc, card
42t1-25/06	. using web-form record carriers, e.g. tape
42t1-25/08	. using filamentary record carriers, e.g. wire
42t1-25/10	. Apparatus capable of using record carriers defined in more than one of the groups 42t1-25/02 to 42t1-25/08
42t1-27/00	Editing; Indexing; Monitoring
42t1-27/02	. Editing, e.g. varying the order of signals reproduced from record carrier
42t1-27/04	. . using differential drive of record carrier and head
42t1-27/06	. . Cutting and rejoining; Notching, or perforating record carriers otherwise than by recording styli (record carriers with provision for splicing 42t1-23/20)
42t1-27/08	. . Re-recording only part of the information
42t1-27/10	. Indexing; Timing (marks or signals on record carriers 42t1-23/30, 42t1-23/42)
42t1-27/12	. . linearly related to time or travel
42t1-27/14	. . . Measuring or indicating elapsed time or travel
42t1-27/16	. . . Indicating time or travel remaining available; Warning of imminent termination
42t1-27/18	. . non-linearly related to time or travel
42t1-27/20	. . . using counters
42t1-27/22	. . Means responsive to presence or absence of recorded signals
42t1-27/24	. . by sensing features on the record carrier other than the transducing track (for controlling purposes 42t1-15/00, 42t1-17/00)
42t1-27/26	. . . by photoelectric detection, e.g. of sprocket holes
42t1-27/28	. . by using signals recorded by the same method as the main recording
42t1-27/30	. . . on the same track as the main recording
42t1-27/32	. . . on separate auxiliary tracks of the same or an auxiliary record carrier
42t1-27/34	. . Indicating arrangements (indicating measured values in general 42d)
42t1-27/36	. Monitoring, i.e. supervising the progress of recording or reproducing
42t1-31/00	Arrangements for the associated working of recording or reproducing apparatus with related apparatus (with cameras or projectors 57a-64, 57a-65)
42t1-31/02	. with automatic musical instruments
42t2	(IPC: G11C) Static stores (recording and playback of information by relative movement between a record track and a transducer 42t1; pulse technique in general 21a1)

Notes:

1. This subclass deals with devices or arrangements for storage of bits of information:

(a) in which no relative movement takes place between an information storage element and a transducer;

(b) which incorporate a selecting-device for writing-in or reading-out the bits of information into or from the store.

2. In this subclass, a storage element is provided with means for writing-in and reading-out at least one item of information. Elements not adapted for storage and not provided with such means are classified in the appropriate subclass.

42t2-5/00 **Details of stores covered by 42t2-11/00**

42t2-5/02 . Disposition of storage elements, e.g. in the form of a matrix array

42t2-5/04	. . Supports for storage elements; Mounting or fixing of storage elements on such supports
42t2-5/06	. Arrangements for interconnecting storage elements electrically, e.g. by wiring
42t2-5/08	. . for interconnecting magnetic elements, e.g. toroidal cores
42t2-5/10	. . for interconnecting capacitors
42t2-5/12	. Apparatus or processes for interconnecting storage elements, e.g. for threading magnetic cores
42t2-7/00	Arrangements for writing information into an electric digital store; Arrangements for reading information out from an electric digital store; Arrangements for selecting an address in an electric digital store
42t2-7/02	. with means for avoiding parasitic signals
42t2-7/04	. with means for avoiding disturbances due to temperature effects
42t2-7/06	. Adaptations of amplifiers
42t2-9/00	Transmission of digital information between stores, e.g. of different types (in digital computing arrangements 42m3-13/00)
42t2-11/00	Digital stores characterised by the use of particular electric or magnetic storage elements; Storage elements therefor (42t2-15/00 to 42t2-21/00 take precedence)
42t2-11/02	. using magnetic elements
42t2-11/04	. . using rod-type storage elements
42t2-11/06	. . using single-aperture storage elements, e.g. ring core; using multi-aperture plates in which each individual aperture forms a storage element
42t2-11/08	. . using multi-aperture storage elements, e.g. using transfluxors; using plates incorporating several individual multi-aperture storage elements
42t2-11/10	. . using multi-axial storage elements
42t2-11/12	. . using tensors; using twistors, i.e. elements in which one axis of magnetisation is twisted
42t2-11/14	. . using thin-film elements
42t2-11/16	. . using elements in which the storage effect is based on magnetic spin effect
42t2-11/18	. using Hall-effect devices
42t2-11/20	. using parametrons
42t2-11/22	. using ferroelectric elements
42t2-11/24	. using capacitors
42t2-11/26	. using discharge tubes
42t2-11/28	. . using gas-filled tubes
42t2-11/30	. . using vacuum tubes
42t2-11/32	. . . using electrostatic memory tubes, e.g. Forester-Haeff store
42t2-11/34	. using semiconductor devices
42t2-11/36	. . using diodes, e.g. used as threshold elements
42t2-11/38	. . . using tunnel diodes
42t2-11/40	. . using transistors
42t2-11/42	. using electro-optical elements
42t2-11/44	. using super-conductive elements, e.g. cryotron
42t2-11/46	. using thermoplastic elements
42t2-11/48	. using displaceable coupling elements, e.g. ferromagnetic cores, to produce change between different states of mutual or self-inductance
42t2-11/50	. using actuation of electric contacts to store the information (mechanical stores 42t2-23/00; switches providing a selected number of consecutive operations of the contacts by a single manual actuation of the operating part 21c-39/01)
42t2-11/52	. . using electromagnetic relays
42t2-11/54	. using elements simulating biological cells, e.g. neuron
42t2-13/00	Digital stores characterised by the use of storage elements not covered by groups 42t2-11/00, 42t2-23/00, or 42t2-25/00
42t2-13/02	. using elements whose operation depends upon chemical change (using electrochemical charge 42t2-11/00)
42t2-13/04	. using optical elements

42t2-15/00	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 stores (in which information is addressed to a specific location 42t2-11/00)
42t2-17/00	Digital stores with provision only for reading-out information and in which a permanent storage pattern may be pre-set, e.g. manually
42t2-19/00	Digital stores in which the information is moved stepwise, e.g. shift register (counting chains 21a1-36/22)
42t2-21/00 42t2-21/02	Digital stores in which the information circulates (stepwise 42t2-19/00) . using electromechanical delay lines, e.g. using a mercury tank
42t2-23/00	Digital stores characterised by movement of mechanical parts to effect storage, e.g. using balls; Storage elements therefor (storing by actuating contacts 42t2-11/48)
42t2-25/00	Digital stores characterised by the use of flowing media; Storage elements therefor
42t2-27/00	Electric analogue stores, e.g. for storing instantaneous values
42t2-29/00	Functional checking of stores