

# International Patent Classification

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Section G  
PHYSICS



World Intellectual Property Organization

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## SECTION G — PHYSICS

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**Note(s)**

- In this section, the following term is used with the meaning indicated:
  - "variable" (as a noun) means a feature or property (e.g., a dimension, a physical condition such as temperature, a quality such as density or colour) which, in respect of a particular entity (e.g., an object, a quantity of a substance, a beam of light) and at a particular instant, is capable of being measured; the variable may change, so that its numerical expression may assume different values at different times, in different conditions or in individual cases, but may be constant in respect of a particular entity in certain conditions or for practical purposes (e.g., the length of a bar may be regarded as constant for many purposes).
- Attention is drawn to the definitions of terms or expressions used, appearing in the notes of several of the classes in this section, in particular those of "measuring" in class G01 and "control" and "regulation" in class G05.
- Classification in this section may present more difficulty than in other sections, because the distinction between different fields of use rests to a considerable extent on differences in the intention of the user rather than on any constructional differences or differences in the manner of use, and because the subjects dealt with are often in effect systems or combinations, which have features or parts in common, rather than "things", which are readily distinguishable as a whole. For example, information (e.g., a set of figures) may be displayed for the purpose of education or advertising ( G09), for enabling the result of a measurement to be known ( G01), for signalling the information to a distant point or for giving information which has been signalled from a distant point ( G08). The words used to describe the purpose depend on features that may be irrelevant to the form of the apparatus concerned, for example, such features as the desired effect on the person who sees the display, or whether the display is controlled from a remote point. Again, a device which responds to some change in a condition, e.g., in the pressure of a fluid, may be used, without modification of the device itself, to give information about the pressure ( G01L) or about some other condition linked to the pressure (another subclass of class G01, e.g., G01K for temperature), to make a record of the pressure or of its occurrence ( G07C), to give an alarm ( G08B), or to control another apparatus ( G05).  
The classification scheme is intended to enable things of a similar nature (as indicated above) to be classified together. It is therefore particularly necessary for the real nature of any technical subject to be decided before it can be properly classified.

## INSTRUMENTS

### G01 MEASURING; TESTING

#### Note(s)

1. This class covers, in addition to "true" measuring instruments, other indicating or recording devices of analogous construction, and also signalling or control devices insofar as they are concerned with measurement (as defined in Note 2 below) and are not specially adapted to the particular purpose of signalling or control.
2. In this class, the following term is used with the meaning indicated:
  - "measuring" is used to cover considerably more than its primary or basic meaning. In this primary sense, it means finding a numerical expression of the value of a variable in relation to a unit or datum or to another variable of the same nature, e.g. expressing a length in terms of another length as in measuring a length with a scale; the value may be obtained directly (as just suggested) or by measuring some other variable of which the value can be related to the value of the required variable, as in measuring a change in temperature by measuring a resultant change in the length of a column of mercury. However, since the same device or instrument may, instead of giving an immediate indication, be used to produce a record or to initiate a signal to produce an indication or control effect, or may be used in combination with other devices or instruments to give a conjoint result from measurement of two or more variables of the same or different kinds, it is necessary to interpret "measuring" as including also any operation that would make it possible to obtain such a numerical expression by the additional use of some way of converting a value into figures. Thus the expression in figures may be actually made by a digital presentation or by reading a scale, or an indication of it may be given without the use of figures, e.g. by some perceptible feature (variable) of the entity (e.g. object, substance, beam of light) of which the variable being measured is a property or condition or by an analogue of such a feature (e.g. the corresponding position of a member without any scale, a corresponding voltage generated in some way). In many cases there is no such value indication but only an indication of difference or equality in relation to a standard or datum (of which the value may or may not be known in figures); the standard or datum may be the value of another variable of the same nature but of a different entity (e.g. a standard measure) or of the same entity at a different time.  
In its simplest form, measurement may give merely an indication of presence or absence of a certain condition or quality, e.g. movement (in any direction or in a particular direction), or whether a variable exceeds a predetermined value.
3. Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "micro-structural devices" and "micro-structural systems" and the Notes following the title of subclass B82B relating to "nano-structures".
4. Attention is drawn to the Notes following the title of section G, especially as regards the definition of the term "variable".
5. In many measuring arrangements, a first variable to be measured is transformed into a second, or further, variables. The second, or further, variables may be (a) a condition related to the first variable and produced in a member, or (b) a displacement of a member. Further transformation may be needed.  
When classifying such an arrangement, (i) the transformation step, or each transformation step, that is of interest is classified, or (ii) if interest lies only in the system as a whole, the first variable is classified in the appropriate place.  
This is particularly important where two or more conversions take place, for instance where a first variable, for example pressure, is transformed into a second variable, for example an optical property of a sensing body, and that second variable is expressed by means of a third variable, for example an electric effect. In such a case, the following classification places should be considered: the place for the transformation of the first variable, that for sensing the condition caused by that variable, subclass G01D for expression of the measurement, and finally the place for the overall system, if any.
6. The measurement of change in the value of a physical property is classified in the same subclass as the measurement of that physical property, e.g. measurement of expansion of length is classified in subclass G01B.

### G01B MEASURING LENGTH, THICKNESS OR SIMILAR LINEAR DIMENSIONS; MEASURING ANGLES; MEASURING AREAS; MEASURING IRREGULARITIES OF SURFACES OR CONTOURS

#### Note(s)

1. This subclass covers measuring of position or displacement in terms of linear or angular dimensions.
2. In this subclass, the groups are distinguished by the means of measurement which is of major importance. Thus the mere application of other means for giving a final indication does not affect the classification.
3. Attention is drawn to the Notes following the title of class G01.
4. Machines operated on similar principles to the hand-held devices specified in this subclass are classified with these devices.
5. Measuring arrangements or details thereof covered by two or more of groups G01B 3/00-G01B 17/00 are classified in group G01B 21/00 if no single other group can be selected as being predominantly applicable.

#### Subclass index

MEASURING DEVICES CHARACTERISED BY THE MATERIAL.....	1/00
PREDOMINANT METHODS USED IN MEASURING DEVICES	
Mechanical.....	3/00, 5/00
Electric or magnetic.....	7/00
By fluids.....	13/00

By light waves; by other electro-magnetic waves or radiation.....	9/00, 11/00, 15/00
By sonic waves.....	17/00
OTHER MEASURING ARRANGEMENTS.....	21/00

<b>1/00</b>	<b>Measuring instruments characterised by the selection of material therefor</b>	5/04	• • specially adapted for measuring length or width of objects while moving
<b>3/00</b>	<b>Instruments as specified in the subgroups and characterised by the use of mechanical measuring means</b> (arrangements for measuring particular parameters G01B 5/00; devices of general interest specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material B65H 75/34) [2]	5/06	• • for measuring thickness
3/02	• Rulers or tapes with scales or marks for direct reading	5/08	• for measuring diameters
3/04	• • rigid	5/10	• • of objects while moving
3/06	• • • folding	5/12	• • internal diameters
3/08	• • • extensible	5/14	• for measuring distance or clearance between spaced objects or spaced apertures (G01B 5/24 takes precedence)
3/10	• • flexible	5/16	• • between a succession of regularly spaced objects or regularly spaced apertures
3/11	• Chains for measuring length	5/18	• for measuring depth
3/12	• Measuring wheels	5/20	• for measuring contours or curvatures
3/14	• Templates for checking contours	5/207	• • using a plurality of fixed, simultaneously operating transducers (G01B 5/213-G01B 5/22 take precedence) [6]
3/16	• Compasses, i.e. with a pair of pivoted arms	5/213	• • for measuring radius of curvature [6]
3/18	• Micrometers	5/22	• • Spherometers
3/20	• Slide gauges	5/24	• for measuring angles or tapers; for testing the alignment of axes
3/22	• Feeler-pin gauges, e.g. dial gauges (for measuring contours or curvatures G01B 5/20)	5/245	• • for testing perpendicularity [6]
3/24	• • with open yoke, i.e. calipers	5/25	• • for testing the alignment of axes
3/26	• • Plug gauges	5/252	• • • for measuring eccentricity, i.e. lateral shift between two parallel axes [6]
3/28	• • Depth gauges	5/255	• • for testing wheel alignment
3/30	• Bars, blocks, or strips in which the distance between a pair of faces is fixed, although it may be preadjustable, e.g. end measure, feeler strip	5/26	• for measuring areas, e.g. planimeter (integrators in general G06G)
3/32	• • Holders therefor	5/28	• for measuring roughness or irregularity of surfaces
3/34	• Ring or other apertured gauges, e.g. "go/no-go" gauge	5/30	• for measuring the deformation in a solid, e.g. mechanical strain gauge
3/36	• • for external screw threads	<b>7/00</b>	<b>Measuring arrangements characterised by the use of electric or magnetic means</b>
3/38	• Gauges with an open yoke and opposed faces, i.e. calipers, in which the internal distance between the faces is fixed, although it may be preadjustable	7/004	• for measuring coordinates of points [6]
3/40	• • for external screw threads	7/008	• • using coordinate measuring machines [6]
3/42	• • of limit-gauge type, i.e. "go/no-go" (G01B 3/40 takes precedence)	7/012	• • • Contact-making feeler heads therefor [6]
3/44	• • • preadjustable for wear or tolerance	7/016	• • • • Constructional details of contacts [6]
3/46	• Plug gauges for internal dimensions with engaging surfaces which are at a fixed distance, although they may be preadjustable	7/02	• for measuring length, width, or thickness (G01B 7/004, G01B 7/12 takes precedence) [6]
3/48	• • for internal screw threads	7/04	• • specially adapted for measuring length or width of objects while moving
3/50	• • of limit-gauge type, i.e. "go/no-go" (G01B 3/48 takes precedence)	7/06	• • for measuring thickness
3/52	• • • preadjustable for wear or tolerance	7/12	• for measuring diameters
3/56	• Gauges for measuring angles or tapers, e.g. conical calipers	7/13	• • Internal diameters [6]
<b>5/00</b>	<b>Measuring arrangements characterised by the use of mechanical means</b> (instruments of the types covered by group G01B 3/00 <i>per se</i> G01B 3/00) [2]	7/14	• for measuring distance or clearance between spaced objects or spaced apertures (G01B 7/30 takes precedence)
5/004	• for measuring coordinates of points [6]	7/15	• • being regularly spaced [6]
5/008	• • using coordinate measuring machines [6]	7/16	• for measuring the deformation in a solid, e.g. by resistance strain gauge
5/012	• • • Contact-making feeler heads therefor [6]	7/24	• • using change in magnetic properties
5/016	• • • • Constructional details of contacts [6]	7/26	• for measuring depth
5/02	• for measuring length, width, or thickness (G01B 5/004, G01B 5/08 take precedence) [6]	7/28	• for measuring contours or curvatures
		7/287	• • using a plurality of fixed, simultaneously operating transducers (G01B 7/293 takes precedence) [6]
		7/293	• • for measuring radius of curvature [6]
		7/30	• for measuring angles or tapers; for testing the alignment of axes

## G01B

- 7/305 • • for testing perpendicularity [6]
- 7/31 • • for testing the alignment of axes
- 7/312 • • • for measuring eccentricity, i.e. lateral shift between two parallel axes [6]
- 7/315 • • for testing wheel alignment
- 7/32 • for measuring areas (integrators in general G06G)
- 7/34 • for measuring roughness or irregularity of surfaces
  
- 9/00 Instruments as specified in the subgroups and characterised by the use of optical measuring means** (arrangements for measuring particular parameters G01B 11/00) [2]
- 9/02 • Interferometers
- 9/021 • • using holographic techniques [2]
- 9/023 • • • for contour producing (G01B 9/025-G01B 9/029 take precedence) [2]
- 9/025 • • • Double-exposure technique [2]
- 9/027 • • • in real time [2]
- 9/029 • • • by time averaging [2]
- 9/04 • Measuring microscopes
- 9/06 • Measuring telescopes
- 9/08 • Optical projection comparators
- 9/10 • Goniometers for measuring angles between surfaces
  
- 11/00 Measuring arrangements characterised by the use of optical means** (instruments of the types covered by group G01B 9/00 *per se* G01B 9/00) [2]
- 11/02 • for measuring length, width, or thickness (G01B 11/08 takes precedence)
- 11/03 • • by measuring coordinates of points [3]
- 11/04 • • specially adapted for measuring length or width of objects while moving
- 11/06 • • for measuring thickness
- 11/08 • for measuring diameters
- 11/10 • • of objects while moving
- 11/12 • • internal diameters
- 11/14 • for measuring distance or clearance between spaced objects or spaced apertures (G01B 11/26 takes precedence; rangefinders G01C 3/00)
- 11/16 • for measuring the deformation in a solid, e.g. optical strain gauge
- 11/22 • for measuring depth
- 11/24 • for measuring contours or curvatures
- 11/245 • • using a plurality of fixed, simultaneously operating transducers (G01B 11/255 takes precedence) [7]
- 11/25 • • by projecting a pattern, e.g. moiré fringes, on the object (G01B 11/255 takes precedence) [7]
- 11/255 • • for measuring radius of curvature [7]
- 11/26 • for measuring angles or tapers; for testing the alignment of axes
- 11/27 • • for testing the alignment of axes
- 11/275 • • for testing wheel alignment
- 11/28 • for measuring areas (integrators in general G06G)
- 11/30 • for measuring roughness or irregularity of surfaces
  
- 13/00 Measuring arrangements characterised by the use of fluids**
- 13/02 • for measuring length, width, or thickness (G01B 13/08 takes precedence)
- 13/03 • • by measuring coordinates of points [3]
- 13/04 • • specially adapted for measuring length or width of objects while moving
- 13/06 • • for measuring thickness
- 13/08 • for measuring diameters
- 13/10 • • internal diameters
- 13/12 • for measuring distance or clearance between spaced objects or spaced apertures (G01B 13/18 takes precedence)
- 13/14 • for measuring depth
- 13/16 • for measuring contours or curvatures
- 13/18 • for measuring angles or tapers; for testing the alignment of axes
- 13/19 • • for testing the alignment of axes
- 13/195 • • for testing wheel alignment
- 13/20 • for measuring areas, e.g. pneumatic planimeter (integrators in general G06G)
- 13/22 • for measuring roughness or irregularity of surfaces
- 13/24 • for measuring the deformation in a solid [3]
  
- 15/00 Measuring arrangements characterised by the use of wave or particle radiation** (G01B 9/00, G01B 11/00 take precedence) [4]
- 15/02 • for measuring thickness
- 15/04 • for measuring contours or curvatures
- 15/06 • for measuring the deformation in a solid
- 15/08 • for measuring roughness or irregularity of surfaces [6]
  
- 17/00 Measuring arrangements characterised by the use of infrasonic, sonic, or ultrasonic vibrations** [4]
- 17/02 • for measuring thickness
- 17/04 • for measuring the deformation in a solid, e.g. by vibrating string
- 17/06 • for measuring contours or curvatures [6]
- 17/08 • for measuring roughness or irregularity of surfaces [6]
  
- 21/00 Measuring arrangements or details thereof in so far as they are not adapted to particular types of measuring means of the other groups of this subclass** [3]
- 21/02 • for measuring length, width, or thickness (G01B 21/10 takes precedence) [3]
- 21/04 • • by measuring coordinates of points [3]
- 21/06 • • specially adapted for measuring length or width of objects while moving [3]
- 21/08 • • for measuring thickness [3]
- 21/10 • for measuring diameters [3]
- 21/12 • • of objects while moving [3]
- 21/14 • • internal diameters [3]
- 21/16 • for measuring distance or clearance between spaced objects [3]
- 21/18 • for measuring depth [3]
- 21/20 • for measuring contours or curvatures, e.g. determining profile [3]
- 21/22 • for measuring angles or tapers; for testing the alignment of axes [3]
- 21/24 • • for testing the alignment of axes [3]
- 21/26 • • for testing wheel alignment [3]
- 21/28 • for measuring areas (integrators in general G06G) [3]
- 21/30 • for measuring roughness or irregularity of surfaces [3]
- 21/32 • for measuring the deformation in a solid [3]

**G01C MEASURING DISTANCES, LEVELS OR BEARINGS; SURVEYING; NAVIGATION; GYROSCOPIC INSTRUMENTS; PHOTOGRAMMETRY OR VIDEOGRAMMETRY** (measuring liquid level G01F; radio navigation, determining distance or velocity by use of propagation effects, e.g. Doppler effect, propagation time, of radio waves, analogous arrangements using other waves G01S)

### Note(s)

- In this subclass, the following term is used with the meaning indicated:
  - "navigation" means determining the position and course of land vehicles, ships, aircraft, and space vehicles.
- Attention is drawn to the Notes following the title of class G01.

### Subclass index

#### MEASURING INSTRUMENTS

For measuring angles; inclinations.....	1/00, 9/00
For measuring distances; heights or levels.....	3/00, 22/00, 5/00
Compasses; gyroscopes; other navigation instruments.....	17/00, 19/00, 21/00
Other surveying instruments.....	15/00
Combined instruments.....	23/00
Manufacture, calibrating.....	25/00

TRACING PROFILES.....7/00

PHOTOGRAMMETRY OR VIDEOGRAMMETRY.....11/00

SURVEYING OPEN WATER.....13/00

#### 1/00 Measuring angles

- 1/02 • Theodolites
- 1/04 • • combined with cameras
- 1/06 • • Arrangements for reading scales
- 1/08 • Sextants
- 1/10 • • including an artificial horizon (G01C 1/14 takes precedence)
- 1/12 • • • with a stabilised mirror
- 1/14 • • Periscopic sextants

#### 3/00 Measuring distances in line of sight; Optical rangefinders (tapes, chains, or wheels for measuring length G01B 3/00; active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, G01S 17/48) [1, 2006.01]

- 3/02 • Details
- 3/04 • • Adaptation of rangefinders for combination with telescopes or binoculars
- 3/06 • • Use of electric means to obtain final indication
- 3/08 • • • Use of electric radiation detectors
- 3/10 • using a parallactic triangle with variable angles and a base of fixed length in the observation station, e.g. in the instrument [1, 2006.01]
- 3/12 • • with monocular observation at a single point, e.g. coincidence type (G01C 3/20 takes precedence)
- 3/14 • • with binocular observation at a single point, e.g. stereoscopic type (G01C 3/20 takes precedence)
- 3/16 • • • Measuring marks
- 3/18 • • with one observation point at each end of the base (G01C 3/20 takes precedence)
- 3/20 • • with adaptation to the measurement of the height of an object
- 3/22 • using a parallactic triangle with variable angles and a base of fixed length at, near, or formed by, the object [1, 2006.01]
- 3/24 • using a parallactic triangle with fixed angles and a base of variable length in the observation station, e.g. in the instrument [1, 2006.01]
- 3/26 • using a parallactic triangle with fixed angles and a base of variable length at, near, or formed by, the object [1, 2006.01]

- 3/28 • • with provision for reduction of the distance into the horizontal plane
- 3/30 • • • with adaptation to the measurement of the height of an object, e.g. tachometers
- 3/32 • by focusing the object, e.g. on a ground glass screen

#### 5/00 Measuring height; Measuring distances transverse to line of sight; Levelling between separated points; Surveyors' levels (G01C 3/20, G01C 3/30 take precedence)

- 5/02 • involving automatic stabilisation of the line of sight
- 5/04 • Hydrostatic levelling, i.e. by flexibly interconnected liquid containers at separated points
- 5/06 • by using barometric means

#### 7/00 Tracing profiles (by photogrammetry or videogrammetry G01C 11/00)

- 7/02 • of land surfaces
- 7/04 • • involving a vehicle which moves along the profile to be traced
- 7/06 • of cavities, e.g. tunnels

#### 9/00 Measuring inclination, e.g. by clinometers, by levels

- 9/02 • Details
- 9/04 • • Transmission means between sensing element and final indicator for giving an enlarged reading
- 9/06 • • Electric or photoelectric indication or reading means
- 9/08 • • Means for compensating acceleration forces due to movement of instrument
- 9/10 • by using rolling bodies
- 9/12 • by using a single pendulum (plumb lines G01C 15/10)
- 9/14 • • movable in more than one direction
- 9/16 • by using more than one pendulum
- 9/18 • by using liquids
- 9/20 • • the indication being based on the inclination of the surface of a liquid relative to its container
- 9/22 • • • with interconnected containers in fixed relation to each other

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- 9/24 • • in closed containers partially filled with liquid so as to leave a gas bubble
- 9/26 • • • Details
- 9/28 • • • • Mountings
- 9/30 • • • • Means for adjusting dimensions of bubble
- 9/32 • • • • Means for facilitating the observation of the position of the bubble, e.g. illuminating means
- 9/34 • • • of the tubular type, i.e. for indicating the level in one direction only
- 9/36 • • • of the spherical type, i.e. for indicating the level in all directions
- 11/00 Photogrammetry or videogrammetry, e.g. stereogrammetry; Photographic surveying [1, 2006.01]**
- 11/02 • Picture-taking arrangements specially adapted for photogrammetry or photographic surveying, e.g. controlling overlapping of pictures
- 11/04 • Interpretation of pictures
- 11/06 • • by comparison of two or more pictures of the same area
- 11/08 • • • the pictures not being supported in the same relative position as when they were taken
- 11/10 • • • • using computers to control the position of the pictures
- 11/12 • • • the pictures being supported in the same relative position as when they were taken
- 11/14 • • • • with optical projection (G01C 11/26 takes precedence)
- 11/16 • • • • • in a common plane
- 11/18 • • • • • involving scanning means
- 11/20 • • • • • in separate planes
- 11/22 • • • • with mechanical projection (G01C 11/26 takes precedence)
- 11/24 • • • • with optical-mechanical projection (G01C 11/26 takes precedence)
- 11/26 • • • • using computers to control the position of the pictures
- 11/28 • • • Special adaptation for recording picture point data, e.g. for profiles
- 11/30 • • by triangulation
- 11/32 • • • Radial triangulation
- 11/34 • • • Aerial triangulation
- 11/36 • Videogrammetry, i.e. electronic processing of video signals from different sources to give parallax or range information [2006.01]
- 13/00 Surveying specially adapted to open water, e.g. sea, lake, river or canal (liquid level metering G01F)**
- 15/00 Surveying instruments or accessories not provided for in groups G01C 1/00-G01C 13/00**
- 15/02 • Means for marking measuring points
- 15/04 • • Permanent marks; Boundary markers
- 15/06 • • Surveyors' staffs; Movable markers
- 15/08 • • • Plumbing or registering staffs or markers over ground marks
- 15/10 • Plumb lines
- 15/12 • Instruments for setting out fixed angles, e.g. right angles
- 15/14 • Artificial horizons
- 17/00 Compasses; Devices for ascertaining true or magnetic north for navigation or surveying purposes (using gyroscopic effect G01C 19/00)**
- 17/02 • Magnetic compasses
- 17/04 • • with north-seeking magnetic elements, e.g. needles
- 17/06 • • • Suspending magnetic elements
- 17/08 • • • • by flotation
- 17/10 • • • Comparing observed direction with north indication
- 17/12 • • • • by sighting means, e.g. for surveyors' compasses
- 17/14 • • • • by reference marks, e.g. for ships' compasses
- 17/16 • • • • by clinometers, e.g. for determining dip or strike of geological strata
- 17/18 • • • Supporting or suspending compasses, e.g. by gimbal, by flotation
- 17/20 • • • Observing the compass card or needle
- 17/22 • • • • by projection
- 17/24 • • • • Illumination
- 17/26 • • • • using electric pick-offs for transmission to final indicator, e.g. photocell
- 17/28 • • Electromagnetic compasses (with north-seeking magnetic elements and having electric pick-offs G01C 17/26)
- 17/30 • • • Earth-inductor compasses
- 17/32 • • • Electron compasses
- 17/34 • Sun- or astro-compasses
- 17/36 • Repeaters for remote indication of readings of a master compass
- 17/38 • Testing, calibrating, or compensating of compasses
- 19/00 Gyroscopes; Turn-sensitive devices using vibrating masses; Turn-sensitive devices without moving masses; Measuring angular rate using gyroscopic effects [1, 2013.01]**
- 19/02 • Rotary gyroscopes
- 19/04 • • Details
- 19/06 • • • Rotors
- 19/08 • • • • electrically driven (G01C 19/14 takes precedence)
- 19/10 • • • • • Power supply
- 19/12 • • • • • fluid driven (G01C 19/14 takes precedence)
- 19/14 • • • • Fluid rotors
- 19/16 • • • Suspensions; Bearings
- 19/18 • • • • providing movement of rotor with respect to its rotational axes (G01C 19/20, G01C 19/24 take precedence)
- 19/20 • • • • • in fluid
- 19/22 • • • • • torsional
- 19/24 • • • • using magnetic or electrostatic fields
- 19/26 • • • Caging, i.e. immobilising moving parts, e.g. for transport
- 19/28 • • • Pick-offs, i.e. devices for taking off an indication of the displacement of the rotor axis
- 19/30 • • • Erection devices, i.e. devices for restoring rotor axis to a desired position (for instrument indicating the vertical G01C 19/46)
- 19/32 • • • Indicating or recording means specially adapted for rotary gyroscopes
- 19/34 • • for indicating a direction in the horizontal plane, e.g. directional gyroscopes
- 19/36 • • • with north-seeking action by magnetic means, e.g. gyromagnetic compasses
- 19/38 • • • with north-seeking action by other than magnetic means, e.g. gyrocompasses using earth's rotation
- 19/40 • • for control by signals from a master compass, i.e. repeater compasses

- 19/42 • • for indicating rate of turn; for integrating rate of turn
- 19/44 • • for indicating the vertical
- 19/46 • • • Erection devices for restoring rotor axis to a desired position
- 19/48 • • • • operating by electrical means (G01C 19/54 takes precedence)
- 19/50 • • • • operating by mechanical means (G01C 19/54 takes precedence)
- 19/52 • • • • operating by fluid means (G01C 19/54 takes precedence)
- 19/54 • • • • with correction for acceleration forces due to movement of instrument
- 19/56 • Turn-sensitive devices using vibrating masses, e.g. vibratory angular rate sensors based on Coriolis forces [1, 2012.01]
- 19/5607 • • using vibrating tuning forks (double-ended tuning forks using planar vibrating masses suspended at opposite ends G01C 19/5719) [2012.01]
- 19/5614 • • • Signal processing [2012.01]
- 19/5621 • • • the devices involving a micro-mechanical structure [2012.01]
- 19/5628 • • • Manufacturing; Trimming; Mounting; Housings [2012.01]
- 19/5635 • • • using vibrating wires or strings [2012.01]
- 19/5642 • • • using vibrating bars or beams [2012.01]
- 19/5649 • • • Signal processing [2012.01]
- 19/5656 • • • the devices involving a micro-mechanical structure [2012.01]
- 19/5663 • • • Manufacturing; Trimming; Mounting; Housings [2012.01]
- 19/567 • • using the phase shift of a vibration node or antinode [2012.01]
- 19/5677 • • • of essentially two-dimensional vibrators, e.g. ring-shaped vibrators [2012.01]
- 19/5684 • • • • the devices involving a micro-mechanical structure [2012.01]
- 19/5691 • • • of essentially three-dimensional vibrators, e.g. wine glass-type vibrators [2012.01]
- 19/5698 • • using acoustic waves, e.g. surface acoustic wave gyros [2012.01]
- 19/5705 • • using masses driven in reciprocating rotary motion about an axis [2012.01]
- 19/5712 • • • the devices involving a micro-mechanical structure [2012.01]
- 19/5719 • • using planar vibrating masses driven in a translation vibration along an axis [2012.01]
- 19/5726 • • • Signal processing [2012.01]
- 19/5733 • • • Structural details or topology [2012.01]
- 19/574 • • • • the devices having two sensing masses in anti-phase motion [2012.01]
- 19/5747 • • • • • each sensing mass being connected to a driving mass, e.g. driving frames [2012.01]
- 19/5755 • • • • the devices having a single sensing mass [2012.01]
- 19/5762 • • • • • the sensing mass being connected to a driving mass, e.g. driving frames [2012.01]
- 19/5769 • • • Manufacturing; Mounting; Housings [2012.01]
- 19/5776 • • • Signal processing not specific to any of the devices covered by groups G01C 19/5607-G01C 19/5719 [2012.01]
- 19/5783 • • Mountings or housings not specific to any of the devices covered by groups G01C 19/5607-G01C 19/5719 [2012.01]
- 19/58 • Turn-sensitive devices without moving masses [3]
- 19/60 • • Electronic or nuclear magnetic resonance gyrometers [3, 4]
- 19/62 • • • with optical pumping [3]
- 19/64 • • Gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams [3]
- 19/66 • • • Ring laser gyrometers [5]
- 19/68 • • • • Lock-in prevention [5]
- 19/70 • • • • • by mechanical means [5]
- 19/72 • • • with counter-rotating light beams in a passive ring, e.g. fibre laser gyrometers [5]
- 21/00 **Navigation; Navigational instruments not provided for in groups G01C 1/00-G01C 19/00** (measuring distance traversed on the ground by a vehicle G01C 22/00; control of position, course, altitude or attitude of vehicles G05D 1/00; traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle G08G 1/0968)
- 21/02 • by astronomical means (G01C 21/24, G01C 21/26 take precedence) [1, 7]
- 21/04 • by terrestrial means (G01C 21/24, G01C 21/26 take precedence) [1, 7]
- 21/06 • • involving measuring of drift angle; involving correction for drift
- 21/08 • • involving use of the magnetic field of the earth
- 21/10 • by using measurement of speed or acceleration (G01C 21/24, G01C 21/26 take precedence) [1, 7]
- 21/12 • • executed aboard the object being navigated; Dead reckoning
- 21/14 • • • by recording the course traversed by the object (G01C 21/16 takes precedence)
- 21/16 • • • by integrating acceleration or speed, i.e. inertial navigation
- 21/18 • • • • Stabilised platforms, e.g. by gyroscope
- 21/20 • Instruments for performing navigational calculations (G01C 21/24, G01C 21/26 take precedence) [1, 7]
- 21/22 • • Plotting boards
- 21/24 • specially adapted for cosmonautical navigation
- 21/26 • specially adapted for navigation in a road network [7]
- 21/28 • • with correlation of data from several navigational instruments [7]
- 21/30 • • • Map- or contour-matching [7]
- 21/32 • • • • Structuring or formatting of map data [7]
- 21/34 • • Route searching; Route guidance [7]
- 21/36 • • • Input/output arrangements for on-board computers [7]
- 22/00 **Measuring distance traversed on the ground by vehicles, persons, animals or other moving solid bodies, e.g. using odometers or using pedometers**
- 22/02 • by conversion into electric waveforms and subsequent integration, e.g. using tachometer generator
- 23/00 **Combined instruments indicating more than one navigational value, e.g. for aircraft; Combined measuring devices for measuring two or more variables of movement, e.g. distance, speed, acceleration**
- 25/00 **Manufacturing, calibrating, cleaning, or repairing instruments or devices referred to in the other groups of this subclass** (testing, calibrating, or compensating compasses G01C 17/38)

**G01D MEASURING NOT SPECIALLY ADAPTED FOR A SPECIFIC VARIABLE; ARRANGEMENTS FOR MEASURING TWO OR MORE VARIABLES NOT COVERED BY A SINGLE OTHER SUBCLASS; TARIFF METERING APPARATUS; TRANSFERRING OR TRANSDUCING ARRANGEMENTS NOT SPECIALLY ADAPTED FOR A SPECIFIC VARIABLE; MEASURING OR TESTING NOT OTHERWISE PROVIDED FOR**

### Note(s)

1. This subclass covers:
  - devices for indicating or recording the results of measurements, not peculiar to variables covered by a single other subclass;
  - analogous arrangements but in which the input is not a variable to be measured, e.g. a hand operation;
  - details of measuring instruments, which are of general interest;
  - measurement transducers not adapted solely for the measurement of a single specified variable and not provided for elsewhere, i.e. means for converting the output of a sensing member to another variable where the form or nature of the sensing member does not constrain the means for converting;
  - measuring or testing not otherwise provided for.
2. Attention is drawn to the Notes following the title of class G01.

### Subclass index

#### MEASURING ARRANGEMENTS IN GENERAL

With data restitution in other form than their instantaneous value.....	1/00
With provision for special purposes.....	3/00
Transferring or transducing arrangements not specially adapted for a specific variable.....	5/00
Component parts.....	11/00
INDICATING; COMPONENT PARTS OF INDICATORS.....	7/00, 13/00
RECORDING; COMPONENT PARTS OF RECORDERS.....	9/00, 15/00
TESTING OR CALIBRATING.....	18/00
MEASURING OR TESTING NOT OTHERWISE PROVIDED FOR.....	21/00
TARIFF METERING.....	4/00

**1/00 Measuring arrangements giving results other than momentary value of variable, of general application**  
(G01D 3/00 takes precedence; in tariff metering apparatus G01D 4/00; transducers not specially adapted for a specific variable G01D 5/00)

- 1/02 • giving mean values, e.g. root mean square values (measuring root mean square values of currents or voltages G01R 19/02)
- 1/04 • giving integrated values (giving mean values G01D 1/02)
- 1/06 • • by intermittent summation
- 1/08 • • • over fixed periods of time
- 1/10 • giving differentiated values
- 1/12 • giving a maximum or minimum of a value
- 1/14 • giving a distribution function of a value, i.e. number of times the value comes within specified ranges of amplitude
- 1/16 • giving a value which is a function of two or more values, e.g. product, ratio
- 1/18 • with arrangements for signalling that a predetermined value of an unspecified parameter has been exceeded (G01D 1/14 takes precedence) [3]

**3/00 Measuring arrangements with provision for the special purposes referred to in the subgroups of this group**

- 3/02 • with provision for altering or correcting the transfer function
- 3/024 • • for range change; Arrangements for substituting one sensing member by another [6]
- 3/028 • mitigating undesired influences, e.g. temperature, pressure [6]
- 3/032 • • affecting incoming signal, e.g. by averaging; gating undesired signals [6]
- 3/036 • • on measuring arrangements themselves [6]

- 3/06 • with provision for operation by a null method
- 3/08 • with provision for safeguarding the apparatus, e.g. against abnormal operation, against breakdown
- 3/10 • with provision for switching-in of additional or auxiliary indicators or recorders

**4/00 Tariff metering apparatus** (in taximeters G07B 13/00; apparatus actuated by coins, cards or the like with meter-controlled dispensing of liquid, gas, or electricity G07F 15/00)

- 4/02 • Details
- 4/04 • • Resetting-mechanisms, e.g. for indicating members
- 4/06 • • Arrangement of clutches between driving and indicating member, e.g. of hysteresis clutch (G01D 4/04 takes precedence)
- 4/08 • • Transfer of indication from a counter into a summing counter
- 4/10 • Maximum indicating or recording apparatus, i.e. where the tariff for a period is based on a maximum demand within that period
- 4/12 • • Apparatus for indicating or recording progressive maximum
- 4/14 • • Fixed-demand indicating or recording apparatus, i.e. where indication is made when a predetermined quantity has been consumed during a time interval greater or less than a predetermined time interval
- 4/16 • Apparatus for indicating or recording maximum or minimum load hours
- 4/18 • Apparatus for indicating or recording overconsumption with opposing torque which comes into effect when a predetermined level is exceeded, e.g. subtraction meters

**5/00 Mechanical means for transferring the output of a sensing member; Means for converting the output of a sensing member to another variable where the form or nature of the sensing member does not constrain the means for converting; Transducers not specially adapted for a specific variable**  
(G01D 3/00 takes precedence; specially adapted for apparatus giving results other than momentary value of variable G01D 1/00) [6]

**Note(s)**

Groups G01D 5/02-G01D 5/54 are distinguished by the means which is of major importance. Thus the mere application of other means for giving a final indication does not affect the classification.

- 5/02 • using mechanical means
- 5/04 • • using levers; using cams; using gearing
- 5/06 • • acting through a wall or enclosure, e.g. by bellows, by magnetic coupling
- 5/08 • • Reducing the effects of friction, e.g. by applying vibrations
- 5/10 • • Applying external forces to increase force available for operation of indicating or recording part
- 5/12 • using electric or magnetic means (G01D 5/06 takes precedence) [3]
- 5/14 • • influencing the magnitude of a current or voltage
- 5/16 • • • by varying resistance
- 5/165 • • • • by relative movement of a point of contact and a resistive track [6]
- 5/18 • • • by varying effective impedance of discharge tubes or semiconductor devices
- 5/20 • • • by varying inductance, e.g. by a movable armature
- 5/22 • • • • differentially influencing two coils
- 5/24 • • • by varying capacitance
- 5/241 • • • • by relative movement of capacitor electrodes [6]
- 5/242 • • • by varying output of an electrodynamic device, e.g. of a tachodynamo
- 5/243 • • influencing the phase or frequency of ac
- 5/244 • • influencing characteristics of pulses or pulse trains; generating pulses or pulse trains [6]
- 5/245 • • • using a variable number of pulses in a train
- 5/246 • • • by varying the duration of individual pulses
- 5/247 • • • using time shifts of pulses
- 5/248 • • • by varying pulse repetition frequency
- 5/249 • • • using pulse code
- 5/25 • • Selecting one or more conductors or channels from a plurality of conductors or channels, e.g. by closing contacts
- 5/251 • • • one conductor or channel
- 5/252 • • • a combination of conductors or channels
- 5/26 • using optical means, i.e. using infra-red, visible or ultra-violet light
- 5/28 • • with deflection of beams of light, e.g. for direct optical indication (G01D 5/40 takes precedence)
- 5/30 • • • the beams of light being detected by photocells
- 5/32 • • with attenuation or whole or partial obturation of beams of light (G01D 5/40 takes precedence)
- 5/34 • • • the beams of light being detected by photocells
- 5/347 • • • • using displacement encoding scales [6]
- 5/353 • • • • influencing the transmission properties of an optical fibre [6]
- 5/36 • • • • Forming the light into pulses
- 5/38 • • • • • by diffraction gratings

- 5/39 • • Scanning a visible indication of the measured value and reproducing this indication at a remote place, e.g. on the screen of a cathode-ray tube
- 5/40 • • specially adapted for use with infra-red light
- 5/42 • using fluid means
- 5/44 • • using jets of fluid
- 5/46 • • • by deflecting or throttling the flow
- 5/48 • using wave or particle radiation means (G01D 5/26 takes precedence)
- 5/50 • • derived from a radioactive source
- 5/52 • • • detected by a counter tube
- 5/54 • using means specified in two or more of groups G01D 5/02, G01D 5/12, G01D 5/26, G01D 5/42, and G01D 5/48

**Note(s)**

Classification is made in this group only if no other group can be selected as being predominantly applicable.

**Note(s)**

For a combination of two or more of the means specified, the first applicable one of subgroups G01D 5/56-G01D 5/62 takes precedence over any others of these groups.

- 5/56 • • using electric or magnetic means
- 5/58 • • using optical means, i.e. using infra-red, visible or ultra-violet light
- 5/60 • • using fluid means
- 5/62 • • using wave or particle radiation means not covered by group G01D 5/58

**7/00 Indicating measured values**

- 7/02 • Indicating value of two or more variables simultaneously
- 7/04 • • using a separate indicating element for each variable
- 7/06 • • • Luminous indications projected on a common screen
- 7/08 • • using a common indicating element for two or more variables
- 7/10 • • • giving indication in co-ordinate form
- 7/12 • Audible indication of meter readings, e.g. for the blind [2]

**9/00 Recording measured values**

- 9/02 • Producing one or more recordings of the values of a single variable
- 9/04 • • with provision for multiple or alternative recording
- 9/06 • • • Multiple recording, e.g. duplicating
- 9/08 • • • • giving both graphical and numerical recording
- 9/10 • • the recording element, e.g. stylus, being controlled in accordance with the variable, and the recording medium, e.g. paper roll, being controlled in accordance with time
- 9/12 • • • recording occurring continuously
- 9/14 • • • • with provision for altering speed of recording medium in accordance with the magnitude of the variable to be recorded
- 9/16 • • • recording occurring at separated intervals, e.g. by chopper bar
- 9/18 • • • • recording element actuated only upon change in value of variable

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- 9/20
    - the recording element, e.g. stylus, being controlled in accordance with time and the recording medium, e.g. paper roll, being controlled in accordance with the variable
  - 9/22
    - recording occurring continuously
  - 9/24
    - recording occurring at separated intervals, e.g. by chopper bar
  - 9/26
    - either the recording element, e.g. stylus, or the recording medium, e.g. paper roll, being controlled in accordance with both time and the variable
  - 9/28
    - Producing one or more recordings, each recording being of the values of two or more different variables (G01D 9/38, G01D 9/40 take precedence)
  - 9/30
    - there being a separate recording element for each variable, e.g. multiple-pen recorder
  - 9/32
    - there being a common recording element for two or more variables
  - 9/34
    - the variables being recorded in predetermined sequence
  - 9/36
    - in separate columns
  - 9/38
    - Producing one or more recordings, each recording being produced by controlling the recording element, e.g. stylus, in accordance with one variable and controlling the recording medium, e.g. paper roll, in accordance with another variable
  - 9/40
    - Producing one or more recordings, each recording being produced by controlling either the recording element, e.g. stylus, or the recording medium, e.g. paper roll, in accordance with two or more variables
  - 9/42
    - Recording indications of measuring instruments by photographic means, e.g. of counters
  - 11/00 Component parts of measuring arrangements not specially adapted for a specific variable (G01D 13/00, G01D 15/00 take precedence)**
  - 11/02
    - Bearings or suspensions for moving parts
  - 11/04
    - Knife-edge bearings
  - 11/06
    - Strip or thread suspensions, e.g. in tension
  - 11/08
    - Elements for balancing moving parts
  - 11/10
    - Elements for damping the movement of parts
  - 11/12
    - using fluid damping
  - 11/14
    - using magnetic induction damping
  - 11/16
    - Elements for restraining or preventing the movement of parts, e.g. for zeroising (caging of moving parts when not in use G01D 11/20)
  - 11/18
    - Springs (G01D 11/06 takes precedence)
  - 11/20
    - Caging devices for moving parts when not in use
  - 11/22
    - automatically actuated
  - 11/24
    - Housings
  - 11/26
    - Windows; Cover glasses; Sealings therefor
  - 11/28
    - Structurally-combined illuminating devices
  - 11/30
    - Supports specially adapted for an instrument; Supports specially adapted for a set of instruments
  - 13/00 Component parts of indicators for measuring arrangements not specially adapted for a specific variable**
- 13/02
    - Scales; Dials
  - 13/04
    - Construction
  - 13/06
    - Moving bands (G01D 13/10 takes precedence)
  - 13/08
    - Rotating drums (G01D 13/10 takes precedence)
  - 13/10
    - with adjustable scales; with auxiliary scales, e.g. vernier
  - 13/12
    - Graduation
  - 13/14
    - for rotations of more than 360°
  - 13/16
    - with staggered markings
  - 13/18
    - with raised or recessed markings
  - 13/20
    - with luminescent markings
  - 13/22
    - Pointers, e.g. settable pointer
  - 13/24
    - for indicating a maximum or minimum
  - 13/26
    - adapted to perform a further operation, e.g. making electrical contact
  - 13/28
    - with luminescent markings
  - 15/00 Component parts of recorders for measuring arrangements not specially adapted for a specific variable**
  - 15/02
    - Styli or other recording elements acting to mechanically deform or perforate the recording surface (printing recording elements G01D 15/20)
  - 15/04
    - acting to punch holes in the recording surface
  - 15/06
    - Electric recording elements, e.g. electrolytic
  - 15/08
    - for spark erosion
  - 15/10
    - Heated recording elements acting on heat-sensitive layers
  - 15/12
    - Magnetic recording elements
  - 15/14
    - Optical recording elements; Recording elements using X- or nuclear radiation
  - 15/16
    - Recording elements transferring recording material, e.g. ink, to the recording surface (printing recording elements G01D 15/20)
  - 15/18
    - Nozzles emitting recording material
  - 15/20
    - Recording elements for printing with ink or for printing by deformation or perforation of the recording surface, e.g. embossing
  - 15/22
    - Chopper bars for bringing recording element into contact with recording surface
  - 15/24
    - Drives for recording elements or surfaces, not covered by group G01D 5/00
  - 15/26
    - operating by clockwork
  - 15/28
    - Holding means for recording surfaces; Guiding means for recording surfaces; Exchanging means for recording surfaces
  - 15/30
    - for foldable strip charts
  - 15/32
    - for circular charts
  - 15/34
    - Recording surfaces
  - 18/00 Testing or calibrating apparatus or arrangements provided for in groups G01D 1/00-G01D 15/00**
  - 21/00 Measuring or testing not otherwise provided for**
  - 21/02
    - Measuring two or more variables by means not covered by a single other subclass

## G01F MEASURING VOLUME, VOLUME FLOW, MASS FLOW, OR LIQUID LEVEL; METERING BY VOLUME [2, 5]

### Note(s)

Attention is drawn to the Notes following the title of class G01.

**Subclass index**

MEASURING VOLUME.....	17/00, 19/00, 22/00
MEASURING VOLUME FLOW	
In continuous flow; in discontinuous flow; by proportion of flow.....	1/00, 3/00, 5/00
With multiple measuring ranges.....	7/00
By comparison with another value.....	9/00
LEVEL INDICATORS.....	23/00
METERING BY VOLUME.....	11/00, 13/00
DETAILS, ACCESSORIES.....	15/00
TESTING, CALIBRATING.....	25/00

**Measuring volume flow**

**1/00 Measuring the volume flow or mass flow of fluid or fluent solid material wherein the fluid passes through the meter in a continuous flow** (measuring a proportion of the volume flow G01F 5/00) [2]

**Note(s)**

Groups G01F 1/704-G01F 1/76 take precedence over groups G01F 1/05-G01F 1/68.

1/05	• by using mechanical effects [2]	1/48	• • • the pressure or differential pressure being created by a capillary element [2]
1/06	• • using rotating vanes with tangential admission [2]	1/50	• • • Correcting or compensating means [2]
1/07	• • • with mechanical coupling to the indicating device [2]	1/52	• • by measuring the height of the fluid level due to the lifting power of the fluid flow [2]
1/075	• • • with magnetic or electromagnetic coupling to the indicating device [2]	1/54	• • by means of chains, flexible bands, or wires introduced into, and moved by, the flow [2]
1/08	• • • Adjusting, correcting, or compensating means therefor [2]	1/56	• by using electric or magnetic effects (G01F 1/66 takes precedence) [2]
1/10	• • using rotating vanes with axial admission [2]	1/58	• • by electromagnetic flowmeters [2]
1/11	• • • with mechanical coupling to the indicating device [2]	1/60	• • • Circuits therefor [2]
1/115	• • • with magnetic or electromagnetic coupling to the indicating device [2]	1/64	• • by measuring electrical currents passing through the fluid flow; by measuring electrical potential generated by the fluid flow, e.g. by electrochemical, contact, or friction effects (G01F 1/58 takes precedence) [2]
1/12	• • • Adjusting, correcting, or compensating means therefor	1/66	• by measuring frequency, phase shift, or propagation time of electromagnetic or other waves, e.g. ultrasonic flowmeters [2]
1/20	• • by detection of dynamic effects of the fluid flow [2]	1/68	• by using thermal effects [2]
1/22	• • • by variable-area meters [2]	1/684	• • Structural arrangements; Mounting of elements, e.g. in relation to fluid flow [6]
1/24	• • • • with magnetic or electric coupling to the indicating device [2]	1/688	• • • using a particular type of heating, cooling or sensing element [6]
1/26	• • • • of the valve type [2]	1/69	• • • • of resistive type [6]
1/28	• • • by drag-force, e.g. vane type or impact flowmeter [2]	1/692	• • • • • Thin-film arrangements [6]
1/30	• • • • for fluent solid material [2]	1/696	• • Circuits therefor, e.g. constant-current flow meters [6]
1/32	• • • by swirl flowmeter, e.g. using Karman vortices [2]	1/698	• • • Feedback or rebalancing circuits, e.g. self heated constant temperature flowmeters [6]
1/34	• • by measuring pressure or differential pressure [2]	1/699	• • • • by control of a separate heating or cooling element [6]
1/36	• • • the pressure or differential pressure being created by the use of flow constriction [2]	1/704	• using marked regions or existing inhomogeneities within the fluid stream, e.g. statistically occurring variations in a fluid parameter (G01F 1/76, G01F 25/00 take precedence) [4]
1/37	• • • • the pressure or differential pressure being measured by means of communicating tubes or reservoirs with movable fluid levels, e.g. by U-tubes [2]	1/708	• • Measuring the time taken to traverse a fixed distance [4]
1/38	• • • • the pressure or differential pressure being measured by means of a movable element, e.g. diaphragm, piston, Bourdon tube or flexible capsule [2]	1/712	• • • using auto-correlation or cross-correlation detection means [4]
1/40	• • • • Details of construction of the flow constriction devices [2]	1/716	• • • using electron paramagnetic resonance (EPR) or nuclear magnetic resonance (NMR) [4]
1/42	• • • • • Orifices or nozzles [2]	1/72	• Devices for measuring pulsing fluid flows [2]
1/44	• • • • • Venturi tubes [2]	1/74	• Devices for measuring flow of a fluid or flow of a fluent solid material in suspension in another fluid [2]
1/46	• • • • • Pitot tubes [2]	1/76	• Devices for measuring mass flow of a fluid or a fluent solid material [2]
		1/78	• • Direct mass flowmeters [2]
		1/80	• • • operating by measuring pressure, force, momentum, or frequency of a fluid flow to which a rotational movement has been imparted [2]

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- 1/82 • • • using a driven wheel as impeller and one or more other wheels or moving elements which are angularly restrained by a resilient member, e.g. spring member, as the measuring device [2]
- 1/84 • • • Coriolis or gyroscopic mass flowmeters [2]
- 1/86 • • Indirect mass flowmeters, e.g. measuring volume flow and density, temperature, or pressure [2]
- 1/88 • • • with differential-pressure measurement to determine the volume flow [2]
- 1/90 • • • with positive-displacement meter or turbine meter to determine the volume flow [2]

### 3/00 Measuring the volume flow of fluids or fluent solid material wherein the fluid passes through the meter in successive and more or less isolated quantities, the meter being driven by the flow (measuring a proportion of the volume flow G01F 5/00)

- 3/02 • with measuring chambers which expand or contract during measurement
- 3/04 • • having rigid movable walls
- 3/06 • • • comprising members rotating in a fluid-tight or substantially fluid-tight manner in a housing
- 3/08 • • • Rotary-piston or ring-piston meters
- 3/10 • • • Geared or lobed impeller meters
- 3/12 • • • Meters with nutating members, e.g. discs
- 3/14 • • • comprising reciprocating pistons, e.g. reciprocating in a rotating body
- 3/16 • • • in stationary cylinders
- 3/18 • • • involving two or more cylinders
- 3/20 • • having flexible movable walls, e.g. diaphragms, bellows
- 3/22 • • • for gases
- 3/24 • with measuring chambers moved during operation (wet gas-meters G01F 3/30)
- 3/26 • • Tilting-trap meters
- 3/28 • • on carriers rotated by the weight of the liquid in the measuring chambers
- 3/30 • Wet gas-meters
- 3/32 • • comprising partitioned drums rotating or nutating in a liquid
- 3/34 • • comprising bells reciprocating in a liquid
- 3/36 • with stationary measuring chambers having constant volume during measurement (with measuring chambers which expand or contract during measurement G01F 3/02)
- 3/38 • • having only one measuring chamber

### 5/00 Measuring a proportion of the volume flow

### 7/00 Volume-flow measuring devices with two or more measuring ranges; Compound meters

### 9/00 Measuring volume flow relative to another variable, e.g. of liquid fuel for an engine

- 9/02 • wherein the other variable is the speed of a vehicle

## Metering by volume

### 11/00 Apparatus requiring external operation adapted at each repeated and identical operation to measure and separate a predetermined volume of fluid or fluent solid material from a supply or container, without regard to weight, and to deliver it

- 11/02 • with measuring chambers which expand or contract during measurement
- 11/04 • • of the free-piston type

- 11/06 • • • with provision for varying the stroke of the piston
- 11/08 • • of the diaphragm or bellows type
- 11/10 • with measuring chambers moved during operation
- 11/12 • • of the valve type, i.e. the separating being effected by fluid-tight or powder-tight movements (involving the tilting or inverting of the supply vessel G01F 11/26)
- 11/14 • • • wherein the measuring chamber reciprocates
- 11/16 • • • for liquid or semiliquid
- 11/18 • • • for fluent solid material
- 11/20 • • • wherein the measuring chamber rotates or oscillates
- 11/22 • • • for liquid or semiliquid
- 11/24 • • • for fluent solid material
- 11/26 • • wherein the measuring chamber is filled and emptied by tilting or inverting the supply vessel, e.g. bottle-emptying apparatus
- 11/28 • with stationary measuring chambers having constant volume during measurement
- 11/30 • • with supply and discharge valves of the lift or plug-lift type
- 11/32 • • • for liquid or semiliquid
- 11/34 • • • for fluent solid material
- 11/36 • • with supply or discharge valves of the rectilinearly-moved slide type
- 11/38 • • • for liquid or semiliquid
- 11/40 • • • for fluent or solid material
- 11/42 • • with supply or discharge valves of the rotary or oscillatory type
- 11/44 • • • for liquid or semiliquid
- 11/46 • • • for fluent solid material

### 13/00 Apparatus for measuring by volume and delivering fluids or fluent solid materials, not provided for in the preceding groups

### 15/00 Details of, or accessories for, apparatus of groups G01F 1/00-G01F 13/00 insofar as such details or appliances are not adapted to particular types of such apparatus

- 15/02 • Compensating or correcting for variations in pressure, density, or temperature
- 15/04 • • of gases to be measured
- 15/06 • Indicating or recording devices, e.g. for remote indication
- 15/07 • Integration to give total flow, e.g. using mechanically-operated integrating mechanism [2]
- 15/075 • • using electrically-operated integrating means [2]
- 15/08 • Air or gas separators in combination with liquid meters; Liquid separators in combination with gas-meters
- 15/10 • Preventing damage by freezing or excess pressure or insufficient pressure
- 15/12 • Cleaning arrangements; Filters
- 15/14 • Casings, e.g. of special material
- 15/16 • Diaphragms; Bellows; Mountings therefor
- 15/18 • Supports or connecting means for meters

**Measuring volume**

- 17/00 Methods or apparatus for determining the capacity of containers or cavities, or the volume of solid bodies** (measuring linear dimensions to determine volume G01B)
- 19/00 Calibrated capacity measures for fluids or fluent solid material, e.g. measuring cups**
- 22/00 Methods or apparatus for measuring volume of fluids or fluent solid material, not otherwise provided for** [5]
- 22/02 • involving measurement of pressure [5]

**Level indicators**

- 23/00 Indicating or measuring liquid level, or level of fluent solid material, e.g. indicating in terms of volume, indicating by means of an alarm**

- 23/02 • by gauge glasses or other apparatus involving a window or transparent tube for directly observing the level to be measured or the level of a liquid column in free communication with the main body of the liquid
- 23/04 • by dip members, e.g. dip-sticks
- 23/14 • by measurement of pressure
- 23/16 • • Indicating, recording, or alarm devices being actuated by mechanical or fluid means, e.g. using gas, mercury, or a diaphragm as transmitting element, or by a column of liquid
- 23/18 • • Indicating, recording, or alarm devices actuated electrically
- 23/20 • by measurement of weight, e.g. to determine the level of stored liquefied gas
- 23/22 • by measurement of physical variables, other than linear dimensions, pressure, or weight, dependent on the level to be measured, e.g. by difference of heat transfer of steam or water (involving the use of floats G01F 23/30)
- 23/24 • • by measuring variations of resistance of resistors due to contact with conductor fluid
- 23/26 • • by measuring variations of capacity or inductance of capacitors or inductors arising from the presence of liquid or fluent solid material in the electric or electromagnetic fields
- 23/28 • • by measuring the variations of parameters of electromagnetic or acoustic waves applied directly to the liquid or fluent solid material [6]

- 23/284 • • • Electromagnetic waves [6]
- 23/288 • • • X-rays; Gamma rays [6]
- 23/292 • • • Light [6]
- 23/296 • • • Acoustic waves [6]
- 23/30 • by floats [4]
- 23/32 • • using rotatable arms or other pivotable transmission elements [4]
- 23/34 • • • using mechanically actuated indicating means [4]
- 23/36 • • • using electrically actuated indicating means [4]
- 23/38 • • • using magnetically actuated indicating means [4]
- 23/40 • • using bands or wires as transmission elements [4]
- 23/42 • • • using mechanically actuated indicating means [4]
- 23/44 • • • using electrically actuated indicating means [4]
- 23/46 • • • using magnetically actuated indicating means [4]
- 23/48 • • using twisted spindles as transmission elements [4]
- 23/50 • • • using mechanically actuated indicating means [4]
- 23/52 • • • using electrically actuated indicating means [4]
- 23/54 • • • using magnetically actuated indicating means [4]
- 23/56 • • using elements rigidly fixed to, and rectilinearly moving with, the floats as transmission elements [4]
- 23/58 • • • using mechanically actuated indicating means [4]
- 23/60 • • • using electrically actuated indicating means [4]
- 23/62 • • • using magnetically actuated indicating means [4]
- 23/64 • • of the free float type [4]
- 23/66 • • • using mechanically actuated indicating means [4]
- 23/68 • • • using electrically actuated indicating means [4]
- 23/70 • • • • for sensing changes in level only at discrete points [4]
- 23/72 • • • using magnetically actuated indicating means [4]
- 23/74 • • • • for sensing changes in level only at discrete points [4]
- 23/76 • • characterised by the construction of the float [4]
- 25/00 Testing or calibrating of apparatus for measuring volume, volume flow, or liquid level, or for metering by volume**

**G01G WEIGHING****Note(s)**

Attention is drawn to the Notes following the title of class G01.

**Subclass index****WEIGHING APPARATUS CHARACTERISED BY THE MEANS USED**

Mechanical.....	1/00, 3/00
Fluidic.....	5/00
Electric, magnetic.....	7/00
Other.....	9/00

**WEIGHING APPARATUS CHARACTERISED BY, OR ADAPTED FOR, THE WEIGHING OF LOADS**

HAVING SPECIAL CHARACTERISTICS.....	11/00-19/00
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DETAILS.....	21/00
AUXILIARY DEVICES.....	23/00

### 1/00 Weighing apparatus involving the use of a counterweight or other counterbalancing mass

- 1/02 • Pendulum-weight apparatus
- 1/04 • • the pendulum having a fixed pivot axis
- 1/06 • • • with a plurality of pendulums
- 1/08 • • the pendulum having a moving pivot axis, e.g. a floating pendulum
- 1/10 • • • with a plurality of pendulums
- 1/12 • • Constructional arrangements for obtaining equal indicative divisions
- 1/14 • • Temperature-compensating arrangements
- 1/16 • • Means for correcting for obliquity of mounting
- 1/18 • Balances involving the use of a pivoted beam, i.e. beam balances
- 1/20 • • Beam balances having the pans carried below the beam, and for use with separate counterweights
- 1/22 • • • for precision weighing
- 1/24 • • Platform-type scales, i.e. having the pans carried above the beam
- 1/26 • • with associated counterweight or set of counterweights
- 1/28 • • • involving means for automatically lifting counterweights corresponding to the load
- 1/29 • • • • with electrical or electromechanical control means [3]
- 1/30 • • • wherein the counterweight is in the form of a chain
- 1/32 • • • wherein the counterweights are in the form of rider-weights
- 1/34 • • • involving a fixed counterweight, with poise-weights selectively added to the load side
- 1/36 • • • wherein the counterweights are slidable along the beam, e.g. steelyards
- 1/38 • • • • with automatically-driven counterweight
- 1/40 • • specially adapted for weighing by substitution
- 1/42 • • Temperature-compensating arrangements

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

- 3/02 • wherein the weighing element is in the form of a helical spring
- 3/04 • • using a plurality of springs
- 3/06 • wherein the weighing element is in the form of a spiral spring
- 3/08 • wherein the weighing element is in the form of a leaf spring
- 3/10 • wherein the torsional deformation of a weighing element is measured
- 3/12 • wherein the weighing element is in the form of a solid body stressed by pressure or tension during weighing
- 3/13 • • having piezo-electric or piezo-resistive properties [3]
- 3/14 • • measuring variations of electrical resistance (G01G 3/13 takes precedence) [3]
- 3/142 • • • Circuits specially adapted therefor [3]
- 3/145 • • • • involving comparison with a reference value (G01G 3/147 takes precedence) [3]
- 3/147 • • • • involving digital counting [3]
- 3/15 • • measuring variations of magnetic properties

- 3/16 • • measuring variations of frequency of oscillations of the body

- 3/18 • Temperature-compensating arrangements

### 5/00 Weighing apparatus wherein the balancing is effected by fluid action

- 5/02 • with a float or other member variably immersed in liquid
- 5/04 • with means for measuring the pressure imposed by the load on a liquid
- 5/06 • • using electrical indicating means [3]

### 7/00 Weighing apparatus wherein the balancing is effected by magnetic, electromagnetic, or electrostatic action, or by means not provided for in groups G01G 1/00-G01G 5/00

- 7/02 • by electromagnetic action
- 7/04 • • with means for regulating the current to solenoids
- 7/06 • by electrostatic action

### 9/00 Methods of, or apparatus for, the determination of weight, not provided for in groups G01G 1/00-G01G 7/00

### 11/00 Apparatus for weighing a continuous stream of material during flow; Conveyor-belt weighers

- 11/02 • having mechanical weight-sensitive devices
- 11/04 • having electrical weight-sensitive devices
- 11/06 • having fluid weight-sensitive devices
- 11/08 • having means for controlling the rate of feed or discharge
- 11/10 • • by controlling the height of the material on the belt
- 11/12 • • by controlling the speed of the belt
- 11/14 • using totalising or integrating devices
- 11/16 • • being electric or electronic devices [3]
- 11/18 • • • using digital counting [3]
- 11/20 • • being mechanical devices [3]

### 13/00 Weighing apparatus with automatic feed or discharge for weighing-out batches of material (for weighing a continuous stream G01G 11/00; check-weighing G01G 15/00; for fluids G01G 17/04; apportioning by weight materials to be mixed G01G 19/22; combinatorial weighing G01G 19/387) [5]

- 13/02 • Means for automatically loading weigh-pans or other receptacles, e.g. disposable containers, under control of the weighing mechanism
- 13/04 • • involving dribble-feed means controlled by the weighing mechanism to top up the receptacle to the target weight
- 13/06 • • • wherein the main feed is effected by gravity from a hopper or chute
- 13/08 • • • wherein the main feed is effected by mechanical conveying means, e.g. by belt conveyors or by vibratory conveyors
- 13/10 • • • wherein the main feed is effected by pneumatic conveying means, e.g. by fluidised feed of granular material
- 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

- 13/14 • • Arrangements for determination of, or compensation for, the tare weight of an unloaded container, e.g. of a disposable container
- 13/16 • Means for automatically discharging weigh receptacles under control of the weighing mechanism
- 13/18 • • by valves or flaps in the container bottom
- 13/20 • • by screw conveyors in the weigh receptacle
- 13/22 • • by tilting or rotating the receptacle
- 13/24 • Weighing mechanism control arrangements for automatic feed or discharge
- 13/26 • • involving fluid-pressure systems
- 13/28 • • involving variation of an electrical variable which is used to control loading or discharge of the receptacle
- 13/285 • • • involving comparison with a reference value (G01G 13/29 takes precedence) [3]
- 13/29 • • • involving digital counting [3]
- 13/295 • • • for controlling automatic loading of the receptacle [3]
- 13/30 • • involving limit switches or position-sensing switches
- 13/32 • • • involving photoelectric devices
- 13/34 • • involving mechanical linkage motivated by the weighing mechanism
- 15/00 Arrangements for check-weighing of materials dispensed into removable containers**
- 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 G01G 13/04)
- 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 G01G 13/04)
- 17/00 Apparatus for, or methods of, weighing material of special form or property** (determining weight by measuring volume G01F)
- 17/02 • for weighing material of filamentary or sheet form
- 17/04 • for weighing fluids, e.g. gases, pastes
- 17/06 • • having means for controlling the supply or discharge
- 17/08 • for weighing livestock
- 19/00 Weighing apparatus or methods adapted for special purposes not provided for in groups G01G 11/00-G01G 17/00**
- 19/02 • for weighing wheeled or rolling bodies, e.g. vehicles
- 19/03 • • for weighing during motion (G01G 19/04, G01G 19/07 take precedence) [3]
- 19/04 • • for weighing railway vehicles
- 19/06 • • • on overhead rails
- 19/07 • • for weighing aircraft
- 19/08 • for incorporation in vehicles
- 19/10 • • having fluid weight-sensitive devices
- 19/12 • • having electrical weight-sensitive devices
- 19/14 • for weighing suspended loads (G01G 3/00 takes precedence)
- 19/16 • • having fluid weight-sensitive devices
- 19/18 • • having electrical weight-sensitive devices
- 19/20 • • for weighing unbalanced loads
- 19/22 • for apportioning materials by weighing prior to mixing them
- 19/24 • • using a single weighing apparatus
- 19/26 • • • associated with two or more counterweighted beams
- 19/28 • • • having fluid weight-sensitive devices
- 19/30 • • • having electrical weight-sensitive devices
- 19/32 • • using two or more weighing apparatus
- 19/34 • • with electrical control means
- 19/36 • • with mechanical control means
- 19/38 • • programme controlled, e.g. by perforated tape
- 19/387 • for combinatorial weighing, i.e. selecting a combination of articles whose total weight or number is closest to a desired value [5]
- 19/393 • • using two or more weighing units [5]
- 19/40 • with provisions for indicating, recording, or computing price or other quantities dependent on the weight (indicating means for weighing apparatus G01G 23/18; recording means for weighing apparatus G01G 23/18)
- 19/41 • • using mechanical computing means
- 19/413 • • using electromechanical or electronic computing means
- 19/414 • • • using electronic computing means only [5]
- 19/415 • • • • combined with recording means [5]
- 19/417 • • with provision for checking computing part of balance
- 19/42 • • for counting by weighing (G01G 19/387 takes precedence) [5]
- 19/44 • for weighing persons
- 19/46 • • Spring balances specially adapted for this purpose
- 19/48 • • Pendulum balances specially adapted for this purpose
- 19/50 • • having additional measuring devices, e.g. for height
- 19/52 • Weighing apparatus combined with other objects, e.g. with furniture (with walking-sticks A45B 3/08)
- 19/54 • • combined with writing implements or paper-knives
- 19/56 • • combined with handles of tools or of household implements
- 19/58 • • combined with handles of suit-cases or trunks
- 19/60 • • combined with fishing equipment, e.g. with fishing rods
- 19/62 • Over or under weighing apparatus [3]
- 19/64 • Percentage-indicating weighing apparatus, i.e. for expressing the weight as a percentage of a predetermined or initial weight [3]
- 21/00 Details of weighing apparatus**
- 21/02 • Arrangements of bearings
- 21/04 • • of knife-edge bearings
- 21/06 • • of ball or roller bearings
- 21/07 • • of flexure-plate bearings [3]
- 21/08 • • Bearing mountings or adjusting means therefor
- 21/10 • • Floating suspensions; Arrangements of shock-absorbers
- 21/12 • • Devices for preventing derangement
- 21/14 • Beams
- 21/16 • • of composite construction; Connections between different beams
- 21/18 • Link connections between the beam and the weigh pan
- 21/20 • • for precision weighing apparatus
- 21/22 • Weigh-pans or other weighing receptacles; Weighing platforms
- 21/23 • Support or suspension of weighing platforms (G01G 21/24 takes precedence) [3]
- 21/24 • Guides or linkages for ensuring parallel motion of the weigh-pans

## G01G

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|--|--|
| <p>21/26 • Counterweights; Poise-weights; Sets of weights; Holders for the reception of weights</p> <p>21/28 • Frames; Housings</p> <p>21/30 • Means for preventing contamination by dust</p> <p><b>23/00 Auxiliary devices for weighing apparatus</b></p> <p>23/01 • Testing or calibrating of weighing apparatus [3]</p> <p>23/02 • Relieving mechanisms; Arrestment mechanisms</p> <p>23/04 • • for precision weighing apparatus</p> <p>23/06 • Means for damping oscillations, e.g. of weigh-beams</p> <p>23/08 • • by fluid means</p> <p>23/10 • • by electric or magnetic means</p> <p>23/12 • • specially adapted for preventing oscillations due to movement of the load</p> <p>23/14 • Devices for determining tare weight or for cancelling out the tare by zeroising, e.g. mechanically operated (in connection with automatic loading G01G 13/14)</p> <p>23/16 • • electrically or magnetically operated</p> <p>23/18 • Indicating devices, e.g. for remote indication; Recording devices; Scales, e.g. graduated</p> <p>23/20 • • Indicating the weight by mechanical means</p> <p>23/22 • • • combined with price indicators</p> <p>23/24 • • • involving logarithmic scales</p> | <p>23/26 • • • Drive for the indicating member, e.g. mechanical amplifiers</p> <p>23/28 • • • involving auxiliary or memory marks</p> <p>23/30 • • • with means for illuminating the scale</p> <p>23/32 • • Indicating the weight by optical projection means</p> <p>23/34 • • • combined with price indicators</p> <p>23/35 • • Indicating the weight by photographic recording</p> <p>23/36 • • Indicating the weight by electrical means, e.g. using photoelectric cells</p> <p>23/365 • • • involving comparison with a reference value (G01G 23/37 takes precedence) [3]</p> <p>23/37 • • • involving digital counting</p> <p>23/375 • • • • during the movement of a coded element [3]</p> <p>23/38 • • Recording or coding devices specially adapted for weighing apparatus</p> <p>23/40 • • • mechanically operated</p> <p>23/42 • • • electrically operated</p> <p>23/44 • • • • Coding devices therefor [3]</p> <p>23/46 • • • Devices preventing recording until the weighing mechanism has come to rest [3]</p> <p>23/48 • Temperature-compensating arrangements (G01G 1/14, G01G 1/42, G01G 3/18 take precedence) [3]</p> |
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## G01H MEASUREMENT OF MECHANICAL VIBRATIONS OR ULTRASONIC, SONIC OR INFRASONIC WAVES [4]

### Note(s)

1. This subclass covers the combination of generation and measurement of mechanical vibrations.
2. Attention is drawn to the Notes following the title of class G01.

### Subclass index

#### PRINCIPLE OF THE MEASURING

By direct conduction; by detection in a fluid; by sensitivity to radiation; by detection of changes in electric or magnetic properties.....1/00, 3/00, 9/00, 11/00

#### SPECIAL CHARACTERISTICS MEASURED

Propagation velocity; reverberation time; resonant frequency; mechanical or acoustic impedance.....5/00, 7/00, 13/00, 15/00

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|--|---|
| <p><b>1/00 Measuring vibrations in solids by using direct conduction to the detector</b> (G01H 9/00, G01H 11/00 take precedence)</p> <p>1/04 • of vibrations which are transverse to direction of propagation</p> <p>1/06 • • Frequency</p> <p>1/08 • • Amplitude</p> <p>1/10 • of torsional vibrations</p> <p>1/12 • of longitudinal or not specified vibrations [4]</p> <p>1/14 • • Frequency [4]</p> <p>1/16 • • Amplitude [4]</p> <p><b>3/00 Measuring vibrations by using a detector in a fluid</b> (G01H 7/00, G01H 9/00, G01H 11/00 take precedence)</p> <p>3/04 • Frequency</p> <p>3/06 • • by electric means</p> <p>3/08 • • Analysing frequencies present in complex vibrations, e.g. comparing harmonics present</p> <p>3/10 • Amplitude; Power</p> <p>3/12 • • by electric means (G01H 3/14 takes precedence) [2]</p> <p>3/14 • • Measuring mean amplitude; Measuring mean power; Measuring time integral of power [2]</p> | <p><b>5/00 Measuring propagation velocity of ultrasonic, sonic or infrasonic waves</b></p> <p><b>7/00 Measuring reverberation time</b></p> <p><b>9/00 Measuring mechanical vibrations or ultrasonic, sonic or infrasonic waves by using radiation-sensitive means, e.g. optical means</b></p> <p><b>11/00 Measuring mechanical vibrations or ultrasonic, sonic or infrasonic waves by detecting changes in electric or magnetic properties</b></p> <p>11/02 • by magnetic means, e.g. reluctance [4]</p> <p>11/04 • • using magnetostrictive devices [4]</p> <p>11/06 • by electric means [4]</p> <p>11/08 • • using piezo-electric devices [4]</p> <p><b>13/00 Measuring resonant frequency</b></p> <p><b>15/00 Measuring mechanical or acoustic impedance [3]</b></p> <p><b>17/00 Measuring mechanical vibrations or ultrasonic, sonic or infrasonic waves, not provided for in the other groups of this subclass [4]</b></p> |
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# **G01J MEASUREMENT OF INTENSITY, VELOCITY, SPECTRAL CONTENT, POLARISATION, PHASE OR PULSE CHARACTERISTICS OF INFRA-RED, VISIBLE OR ULTRA-VIOLET LIGHT; COLORIMETRY; RADIATION PYROMETRY [2]**

## **Note(s)**

1. This subclass covers the detection of the presence or absence of infra-red, visible, or ultra-violet light, not otherwise provided for.
2. Attention is drawn to the Notes following the title of class G01.

## **Subclass index**

PHOTOMETRY; PYROMETRY.....1/00, 5/00  
 SPECTROMETRY; MEASURING: POLARISATION; VELOCITY; PHASE; PULSES.....3/00, 4/00, 7/00, 9/00, 11/00

<b>1/00</b>	<b>Photometry, e.g. photographic exposure meter</b> (spectrophotometry G01J 3/00; specially adapted for radiation pyrometry G01J 5/00)	1/60	• by measuring the pupil of the eye
1/02	• Details	<b>3/00</b>	<b>Spectrometry; Spectrophotometry; Monochromators; Measuring colours [4]</b>
1/04	• • Optical or mechanical part	3/02	• Details
1/06	• • • Restricting the angle of incident light	3/04	• • Slit arrangements
1/08	• • Arrangements of light sources specially adapted for photometry	3/06	• • Scanning arrangements
1/10	• by comparison with reference light or electric value	3/08	• • Beam-switching arrangements
1/12	• • using wholly visual means (G01J 1/20 takes precedence)	3/10	• • Arrangements of light sources specially adapted for spectrometry or colorimetry
1/14	• • • using comparison with a surface of graded brightness	3/12	• Generating the spectrum; Monochromators
1/16	• • using electric radiation detectors (G01J 1/20 takes precedence)	3/14	• • using refracting elements, e.g. prism (G01J 3/18, G01J 3/26 take precedence)
1/18	• • • using comparison with a reference electric value	3/16	• • • with autocollimation
1/20	• • intensity of the measured or reference value being varied to equalise their effects at the detector, e.g. by varying incidence angle	3/18	• • using diffraction elements, e.g. grating
1/22	• • • using a variable element in the light-path, e.g. filter, polarising means (G01J 1/34 takes precedence)	3/20	• • • Rowland circle spectrometers
1/24	• • • • using electric radiation detectors	3/22	• • • Littrow mirror spectrometers
1/26	• • • • adapted for automatic variation of the measured or reference value	3/24	• • • using gratings profiled to favour a specific order
1/28	• • • using variation of intensity or distance of source (G01J 1/34 takes precedence)	3/26	• • using multiple reflection, e.g. Fabry-Perot interferometer, variable interference filter
1/30	• • • • using electric radiation detectors	3/28	• Investigating the spectrum (using colour filters G01J 3/51) [4]
1/32	• • • • adapted for automatic variation of the measured or reference value	3/30	• • Measuring the intensity of spectral lines directly on the spectrum itself (G01J 3/42, G01J 3/44 take precedence)
1/34	• • • using separate light-paths used alternately or sequentially, e.g. flicker	3/32	• • • Investigating bands of a spectrum in sequence by a single detector
1/36	• • • • using electric radiation detectors	3/36	• • • Investigating two or more bands of a spectrum by separate detectors
1/38	• using wholly visual means (G01J 1/10 takes precedence)	3/40	• • Measuring the intensity of spectral lines by determining density of a photograph of the spectrum; Spectrography (G01J 3/42, G01J 3/44 take precedence) [4]
1/40	• • using limit of visibility or extinction effect	3/42	• • Absorption spectrometry; Double-beam spectrometry; Flicker spectrometry; Reflection spectrometry (beam-switching arrangements G01J 3/08) [4]
1/42	• using electric radiation detectors (optical or mechanical part G01J 1/04; by comparison with a reference light or electric value G01J 1/10)	3/427	• • • Dual wavelength spectrometry [4]
1/44	• • Electric circuits	3/433	• • • Modulation spectrometry; Derivative spectrometry [4]
1/46	• • • using a capacitor	3/44	• • Raman spectrometry; Scattering spectrometry [4]
1/48	• using chemical effects	3/443	• • Emission spectrometry [4]
1/50	• • using change in colour of an indicator, e.g. actinometer	3/447	• • Polarisation spectrometry [4]
1/52	• • using photographic effects	3/45	• • Interferometric spectrometry [4]
1/54	• • by observing photo-reactions between gases	3/453	• • • by correlation of the amplitudes [4]
1/56	• using radiation pressure or radiometer effect	3/457	• • Correlation spectrometry, e.g. of the intensity (G01J 3/453 takes precedence) [4]
1/58	• using luminescence generated by light		

## G01J

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| <p>3/46 • Measurement of colour; Colour measuring devices, e.g. colorimeters (measuring colour temperature G01J 5/60) [4]</p> <p>3/50 • • using electric radiation detectors [4]</p> <p>3/51 • • • using colour filters [4]</p> <p>3/52 • • using colour charts</p> <p><b>4/00 Measuring polarisation of light [2]</b></p> <p>4/02 • Polarimeters of separated-field type; Polarimeters of half-shadow type [2]</p> <p>4/04 • Polarimeters using electric detection means (G01J 4/02 takes precedence) [2]</p> <p><b>5/00 Radiation pyrometry</b></p> <p>5/02 • Details</p> <p>5/04 • • Casings</p> <p>5/06 • • Arrangements for eliminating effects of disturbing radiation</p> <p>5/08 • • Optical features</p> <p>5/10 • using electric radiation detectors</p> <p>5/12 • • using thermoelectric elements, e.g. thermocouples</p> <p>5/14 • • • Electrical features</p> <p>5/16 • • • • Arrangements with respect to the cold junction; Compensating influence of ambient temperature or other variables</p> <p>5/18 • • • • Special adaptation for indicating or recording</p> <p>5/20 • • using resistors, thermistors, or semiconductors sensitive to radiation</p> <p>5/22 • • • Electrical features</p> <p>5/24 • • • • Use of a specially-adapted circuit, e.g. bridge circuit</p> <p>5/26 • • • • Special adaptation for indicating or recording</p> | <p>5/28 • • using photo-emissive, photo-conductive, or photo-voltaic cells</p> <p>5/30 • • • Electrical features</p> <p>5/32 • • • • Special adaptation for indicating or recording</p> <p>5/34 • • using capacitors</p> <p>5/36 • • using ionisation of gases</p> <p>5/38 • using extension or expansion of solids or fluids</p> <p>5/40 • • using bimetallic elements</p> <p>5/42 • • using Golay cells</p> <p>5/44 • • using change of resonant frequency, e.g. of piezo-electric crystal</p> <p>5/46 • using radiation pressure or radiometer effect</p> <p>5/48 • using wholly visual means</p> <p>5/50 • using techniques specified in the subgroups below</p> <p>5/52 • • using comparison with reference sources, e.g. disappearing-filament pyrometer</p> <p>5/54 • • • Optical features</p> <p>5/56 • • • Electrical features</p> <p>5/58 • • using absorption; using polarisation; using extinction effect</p> <p>5/60 • • using determination of colour temperature</p> <p>5/62 • • using means for chopping the light</p> <p><b>7/00 Measuring velocity of light</b></p> <p><b>9/00 Measuring optical phase difference; Determining degree of coherence; Measuring optical wavelength (spectrometry G01J 3/00) [3]</b></p> <p>9/02 • by interferometric methods [3]</p> <p>9/04 • by beating two waves of the same source but of different frequency and measuring the phase shift of the lower frequency obtained [3]</p> <p><b>11/00 Measuring the characteristics of individual optical pulses or of optical pulse trains [5]</b></p> |
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## G01K MEASURING TEMPERATURE; MEASURING QUANTITY OF HEAT; THERMALLY-SENSITIVE ELEMENTS NOT OTHERWISE PROVIDED FOR (radiation pyrometry G01J 5/00)

### Note(s)

- In this subclass, the following term is used with the meaning indicated:
  - "thermometer" includes thermally-sensitive elements not provided for in other subclasses.
- Attention is drawn to the Notes following the title of class G01.

### Subclass index

#### MEASURING TEMPERATURE

characterised by principle of operation.....	5/00, 7/00, 9/00, 11/00
Thermometers giving an indication other than the instantaneous value.....	3/00
Details of thermometers not specially adapted for particular types of thermometers.....	1/00
Adaptations of thermometers for specific purposes.....	13/00
Testing and calibrating of thermometers.....	15/00
MEASURING QUANTITY OF HEAT; TESTING AND CALIBRATING OF CALORIMETERS.....	17/00, 19/00

- |   |   |
|---|---|
| <p><b>1/00 Details of thermometers not specially adapted for particular types of thermometer</b> (circuits for reducing thermal inertia G01K 7/42) [6]</p> <p>1/02 • Special applications of indicating or recording means, e.g. for remote indications</p> <p>1/04 • • Scales</p> <p>1/06 • • • Arrangements for facilitating reading, e.g. illumination, magnifying glass</p> | <p>1/08 • Protective devices, e.g. casings</p> <p>1/10 • • for preventing chemical attack</p> <p>1/12 • • for preventing damage due to heat overloading</p> <p>1/14 • Supports; Fastening devices; Mounting thermometers in particular locations</p> <p>1/16 • Special arrangements for conducting heat from the object to the sensitive element</p> <p>1/18 • • for reducing thermal inertia</p> |
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- 1/20 • Compensating for effects of temperature changes other than those to be measured, e.g. changes in ambient temperature
- 1/22 • • by means of fluid contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the fluid
- 1/24 • • by means of compounded strips or plates, e.g. bimetallic strips
- 1/26 • Compensating for effects of pressure changes
- 3/00 Thermometers giving results other than momentary value of temperature (G01K 7/42 takes precedence) [6]**
  - 3/02 • giving mean values; giving integrated values
  - 3/04 • • in respect of time
  - 3/06 • • in respect of space
  - 3/08 • giving differences of values; giving differentiated values
  - 3/10 • • in respect of time, e.g. reacting only to a quick change of temperature
  - 3/12 • • • based upon expansion or contraction of materials
  - 3/14 • • in respect of space
- 5/00 Measuring temperature based on the expansion or contraction of a material (G01K 9/00 takes precedence; giving other than momentary value of temperature G01K 3/00)**
  - 5/02 • the material being a liquid (G01K 5/32 takes precedence)
  - 5/04 • • Details
  - 5/06 • • • Arrangements for driving back the liquid column
  - 5/08 • • • Capillary tubes
  - 5/10 • • • Containers for the liquid
  - 5/12 • • • Selection of liquid compositions
  - 5/14 • • the liquid displacing a further liquid column or a solid body (for maximum or minimum indication G01K 5/20)
  - 5/16 • • with electric contacts
  - 5/18 • • with electric conversion means for final indication
  - 5/20 • • with means for indicating a maximum or a minimum or both (G01K 5/22 takes precedence)
  - 5/22 • • with provision for expansion indicating over not more than a few degrees, e.g. clinical thermometer
  - 5/24 • • with provision for measuring the difference between two temperatures
  - 5/26 • • with provision for adjusting zero point of scale, e.g. Beckmann thermometer
  - 5/28 • the material being a gas (G01K 5/32 takes precedence)
  - 5/30 • • the gas displacing a liquid column
  - 5/32 • the material being a fluid contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the material (under pressure developed by evaporation G01K 11/04)
  - 5/34 • • the body being a capsule (G01K 5/36, G01K 5/42 take precedence)
  - 5/36 • • the body being a tubular spring, e.g. Bourdon tube
  - 5/38 • • • of spiral formation
  - 5/40 • • • of helical formation
  - 5/42 • • the body being a bellows
  - 5/44 • • the body being a cylinder and piston
  - 5/46 • • with electric conversion means for final indication
  - 5/48 • the material being a solid
  - 5/50 • • arranged for free expansion or contraction
- 5/52 • • • with electrical conversion means for final indication
- 5/54 • • consisting of pivotally-connected elements
- 5/56 • • constrained so that expansion or contraction causes a deformation of the solid
- 5/58 • • • the solid body being constrained at more than one point, e.g. rod, plate, diaphragm (G01K 5/62 takes precedence)
- 5/60 • • • • the body being a flexible wire or ribbon
- 5/62 • • • the solid body being formed of compounded strips or plates, e.g. bimetallic strip
- 5/64 • • • • Details of the compound system
- 5/66 • • • • • Selection of composition of the components of the system
- 5/68 • • • • • Shape of the system
- 5/70 • • • • specially adapted for indicating or recording
- 5/72 • • • • • with electric transmission means for final indication
- 7/00 Measuring temperature based on the use of electric or magnetic elements directly sensitive to heat (giving results other than momentary value of temperature G01K 3/00)**
  - 7/01 • using semiconducting elements having PN junctions (G01K 7/02, G01K 7/16, G01K 7/30 take precedence) [6]
  - 7/02 • using thermo-electric elements, e.g. thermo-couples
  - 7/04 • • the object to be measured not forming one of the thermo-electric materials
  - 7/06 • • • the thermo-electric materials being arranged one within the other with the junction at one end exposed to the object, e.g. sheathed type
  - 7/08 • • the object to be measured forming one of the thermo-electric materials, e.g. pointed type
  - 7/10 • • Arrangements for compensating for auxiliary variables, e.g. length of lead
  - 7/12 • • • Arrangements with respect to the cold junction, e.g. preventing influence of temperature of surrounding air
  - 7/13 • • • • Circuits for cold-junction compensation [6]
  - 7/14 • • Arrangements for modifying the output characteristic, e.g. linearising
  - 7/16 • using resistive elements
  - 7/18 • • the element being a linear resistance, e.g. platinum resistance thermometer (G01K 7/26 takes precedence)
  - 7/20 • • • in a specially-adapted circuit, e.g. bridge circuit
  - 7/21 • • • • for modifying the output characteristic, e.g. linearising [6]
  - 7/22 • • the element being a non-linear resistance, e.g. thermistor (G01K 7/26 takes precedence)
  - 7/24 • • • in a specially-adapted circuit, e.g. bridge circuit
  - 7/25 • • • • for modifying the output characteristic, e.g. linearising [6]
  - 7/26 • • the element being an electrolyte
  - 7/28 • • • in a specially-adapted circuit, e.g. bridge circuit
  - 7/30 • using thermal noise of resistances or conductors
  - 7/32 • using change of resonant frequency of a crystal
  - 7/34 • using capacitive elements
  - 7/36 • using magnetic elements, e.g. magnets, coils
  - 7/38 • • the variations of temperature influencing the magnetic permeability
  - 7/40 • using ionisation of gases
  - 7/42 • Circuits for reducing thermal inertia; Circuits for predicting the stationary value of temperature [6]

## G01K

9/00	<b>Measuring temperature based on movements caused by redistribution of weight, e.g. tilting thermometer</b> (not giving momentary value of temperature G01K 3/00)	13/06	• • in linear movement
		13/08	• • in rotary movement
		13/10	• for measuring temperature within piled or stacked materials (by special arrangements for conducting heat from the object to the sensitive element G01K 1/16)
11/00	<b>Measuring temperature based on physical or chemical changes not covered by group G01K 3/00, G01K 5/00, G01K 7/00, or G01K 9/00</b>	13/12	• combined with sampling devices for measuring temperatures of samples of material
11/02	• using evaporation or sublimation, e.g. by observing boiling		
11/04	• • from material contained in a hollow body having parts which are deformable or displaceable under the pressure developed by the vapour		
11/06	• using melting, freezing, or softening		
11/08	• • of disposable test bodies, e.g. cone		
11/10	• using sintering		
11/12	• using change of colour or translucency (G01K 11/32 takes precedence) [6]		
11/14	• • of inorganic materials		
11/16	• • of organic materials		
11/18	• • of materials which change translucency		
11/20	• using thermoluminescent materials (G01K 11/32 takes precedence) [6]		
11/22	• using measurement of acoustic effects		
11/24	• • of the velocity of propagation of sound		
11/26	• • of resonant frequencies		
11/28	• using measurements of density		
11/30	• using measurement of the effect of a material on X-radiation, gamma radiation or particle radiation [5]		
11/32	• using changes in transmission, scattering or fluorescence in optical fibres [6]		
13/00	<b>Adaptations of thermometers for specific purposes</b>		
13/02	• for measuring temperature of moving fluids or granular materials capable of flow		
13/04	• for measuring temperature of moving solid bodies		
		15/00	<b>Testing or calibrating of thermometers</b>
		17/00	<b>Measuring quantity of heat</b>
		17/02	• Calorimeters using transport of an indicating substance, e.g. evaporation calorimeters
		17/04	• Calorimeters using compensation methods
		17/06	• Measuring quantity of heat conveyed by flowing media, e.g. in heating systems (G01K 17/02, G01K 17/04 take precedence)
		17/08	• • based upon measurement of temperature difference
		17/10	• • • between an inlet and an outlet point, combined with measurement of rate of flow of the medium
		17/12	• • • • Indicating product of flow and temperature difference directly
		17/14	• • • • • using mechanical means for both measurements
		17/16	• • • • • using electrical means for both measurements
		17/18	• • • • • using electrical means for one measurement and mechanical means for the other
		17/20	• • • across a radiating surface, combined with ascertainment of the heat-transmission coefficient
		19/00	<b>Testing or calibrating calorimeters</b>

## G01L MEASURING FORCE, STRESS, TORQUE, WORK, MECHANICAL POWER, MECHANICAL EFFICIENCY, OR FLUID PRESSURE (weighing G01G) [4]

### Note(s)

Attention is drawn to the Notes following the title of class G01.

### Subclass index

#### MEASURING FORCE, STRESS, TORQUE, WORK, MECHANICAL POWER, MECHANICAL EFFICIENCY

General methods; apparatus adapted to special purposes..... 1/00, 3/00, 5/00

#### MEASURING FLUID PRESSURE

Methods of measuring..... 7/00, 9/00, 11/00

Measurements of differential or multiple pressure values..... 13/00, 15/00

Details of apparatus or accessories..... 19/00

#### SPECIAL ADAPTATIONS OF MEASURING APPARATUS

Measurements of pressure of inflated bodies..... 17/00

Vacuum gauges..... 21/00

#### INDICATORS OF FAST CHANGES, PARTICULARLY IN THE OPERATION OF FLUID-PRESSURE

ENGINES..... 23/00

TESTING OR CALIBRATING..... 25/00, 27/00

1/00	<b>Measuring force or stress, in general</b> (measuring force due to impact G01L 5/00) [4]	1/04	• by measuring elastic deformation of gauges, e.g. of springs
1/02	• by hydraulic or pneumatic means	1/06	• by measuring the permanent deformation of gauges, e.g. of compressed bodies

- 1/08 • by the use of counterbalancing forces
- 1/10 • by measuring variations of frequency of stressed vibrating elements, e.g. of stressed strings (using resistance strain gauges G01L 1/22)
- 1/12 • by measuring variations in the magnetic properties of materials resulting from the application of stress
- 1/14 • by measuring variations in capacitance or inductance of electrical elements, e.g. by measuring variations of frequency of electrical oscillators
- 1/16 • using properties of piezo-electric devices
- 1/18 • using properties of piezo-resistive materials, i.e. materials of which the ohmic resistance varies according to changes in magnitude or direction of force applied to the material
- 1/20 • by measuring variations in ohmic resistance of solid materials or of electrically-conductive fluids (of piezo-resistive materials G01L 1/18); by making use of electrokinetic cells, i.e. liquid-containing cells wherein an electrical potential is produced or varied upon the application of stress
- 1/22 • • using resistance strain gauges
- 1/24 • by measuring variations of optical properties of material when it is stressed, e.g. by photoelastic stress analysis
- 1/25 • using wave or particle radiation, e.g. X-rays, neutrons (G01L 1/24 takes precedence) [4]
- 1/26 • Auxiliary measures taken, or devices used, in connection with the measurement of force, e.g. for preventing influence of transverse components of force, for preventing overload
- 3/00 Measuring torque, work, mechanical power, or mechanical efficiency, in general**
- 3/02 • Rotary-transmission dynamometers
- 3/04 • • wherein the torque-transmitting element comprises a torsionally-flexible shaft
- 3/06 • • • involving mechanical means for indicating
- 3/08 • • • involving optical means for indicating
- 3/10 • • • involving electric or magnetic means for indicating
- 3/12 • • • • involving photoelectric means
- 3/14 • • wherein the torque-transmitting element is other than a torsionally-flexible shaft
- 3/16 • Rotary-absorption dynamometers, e.g. of brake type
- 3/18 • • mechanically actuated
- 3/20 • • fluid actuated
- 3/22 • • electrically or magnetically actuated
- 3/24 • Devices for determining the value of power, e.g. by measuring and simultaneously multiplying the values of torque and revolutions per unit of time, by multiplying the values of tractive or propulsive force and velocity
- 3/26 • Devices for measuring efficiency, i.e. the ratio of power output to power input
- 5/00 Apparatus for, or methods of, measuring force, e.g. due to impact, work, mechanical power, or torque, adapted for special purposes**
- 5/03 • for measuring release force of ski safety bindings
- 5/04 • for measuring tension in ropes, cables, wires, threads, belts, bands, or like flexible members
- 5/06 • • using mechanical means
- 5/08 • • using fluid means
- 5/10 • • using electric means
- 5/12 • for measuring axial thrust in a rotary shaft, e.g. of propulsion plants

- 5/13 • for measuring the tractive or propulsive power of vehicles
- 5/14 • for measuring the force of explosions; for measuring the energy of projectiles
- 5/16 • for measuring several components of force
- 5/18 • for measuring ratios of force
- 5/20 • for measuring wheel side-thrust
- 5/22 • for measuring the force applied to control members, e.g. control members of vehicles, triggers
- 5/24 • for determining value of torque or twisting moment for tightening a nut or other member which is similarly stressed
- 5/26 • for determining the characteristic of torque in relation to revolutions per unit of time
- 5/28 • for testing brakes

### Measuring fluid pressure

- 7/00 Measuring the steady or quasi-steady pressure of a fluid or a fluent solid material by mechanical or fluid pressure-sensitive elements** (transmitting or indicating the displacement of mechanical pressure-sensitive elements by electric or magnetic means G01L 9/00; measuring differences of two or more pressure values G01L 13/00; measuring two or more pressure values simultaneously G01L 15/00)
- 7/02 • in the form of elastically-deformable gauges
- 7/04 • • in the form of flexible, deformable tubes, e.g. Bourdon gauges
- 7/06 • • • of the bellows type
- 7/08 • • • of the flexible-diaphragm type
- 7/10 • • • of the capsule type
- 7/12 • • • • with exhausted chamber; Aneroid barometers
- 7/14 • • • • with zero-setting means
- 7/16 • in the form of pistons
- 7/18 • using liquid as the pressure-sensitive medium, e.g. liquid-column gauges
- 7/20 • • involving a closed chamber above the liquid level, the chamber being exhausted or housing low-pressure gas; Liquid barometers
- 7/22 • • involving floats, e.g. floating bells
- 7/24 • • involving balances in the form of rings partly filled with liquid
- 9/00 Measuring steady or quasi-steady pressure of a fluid or a fluent solid material by electric or magnetic pressure-sensitive elements; Transmitting or indicating the displacement of mechanical pressure-sensitive elements, used to measure the steady or quasi-steady pressure of a fluid or fluent solid material, by electric or magnetic means** (measuring differences of two or more pressure values G01L 13/00; measuring two or more pressure values simultaneously G01L 15/00)
- 9/02 • by making use of variations in ohmic resistance, e.g. of potentiometers
- 9/04 • • of resistance strain gauges
- 9/06 • • of piezo-resistive devices
- 9/08 • by making use of piezo-electric devices
- 9/10 • by making use of variations in inductance
- 9/12 • by making use of variations in capacitance
- 9/14 • involving the displacement of magnets, e.g. electromagnets
- 9/16 • by making use of variations in the magnetic properties of material resulting from the application of stress

9/18	<ul style="list-style-type: none"> <li>by making use of electrokinetic cells, i.e. liquid-containing cells wherein an electric potential is produced or varied upon the application of stress</li> </ul>	21/18	<ul style="list-style-type: none"> <li>using a pendulum</li> </ul>
11/00	<b>Measuring steady or quasi-steady pressure of a fluid or a fluent solid material by means not provided for in group G01L 7/00 or G01L 9/00</b>	21/20	<ul style="list-style-type: none"> <li>using members oscillating about a vertical axis</li> </ul>
11/02	<ul style="list-style-type: none"> <li>by optical means [6]</li> </ul>	21/22	<ul style="list-style-type: none"> <li>using resonance effects of a vibrating body; Vacuum gauges of the Klumb type</li> </ul>
11/04	<ul style="list-style-type: none"> <li>by acoustic means [6]</li> </ul>	21/24	<ul style="list-style-type: none"> <li>using rotating members; Vacuum gauges of the Langmuir type</li> </ul>
11/06	<ul style="list-style-type: none"> <li>Ultrasonic means [6]</li> </ul>	21/26	<ul style="list-style-type: none"> <li>by making use of radiometer action, i.e. of the pressure caused by the momentum of molecules passing from a hotter to a cooler member; Vacuum gauges of the Knudsen type</li> </ul>
13/00	<b>Devices or apparatus for measuring differences of two or more fluid pressure values</b>	21/28	<ul style="list-style-type: none"> <li>using torsional rotary measuring members</li> </ul>
13/02	<ul style="list-style-type: none"> <li>using elastically-deformable members or pistons as sensing elements</li> </ul>	21/30	<ul style="list-style-type: none"> <li>by making use of ionisation effects</li> </ul>
13/04	<ul style="list-style-type: none"> <li>using floats or liquids as sensing elements</li> </ul>	21/32	<ul style="list-style-type: none"> <li>using electric discharge tubes with thermionic cathodes</li> </ul>
13/06	<ul style="list-style-type: none"> <li>using electric or magnetic pressure-sensitive elements</li> </ul>	21/34	<ul style="list-style-type: none"> <li>using electric discharge tubes with cold cathodes</li> </ul>
15/00	<b>Devices or apparatus for measuring two or more fluid pressure values simultaneously</b>	21/36	<ul style="list-style-type: none"> <li>using radioactive substances</li> </ul>
17/00	<b>Devices or apparatus for measuring tyre pressure or the pressure in other inflated bodies</b>	23/00	<b>Devices or apparatus for measuring or indicating or recording rapid changes, such as oscillations, in the pressure of steam, gas, or liquid; Indicators for determining work or energy of steam, internal-combustion, or other fluid-pressure engines from the condition of the working fluid</b>
19/00	<b>Details of, or accessories for, apparatus for measuring steady or quasi-steady pressure of a fluent medium insofar as such details or accessories are not special to particular types of pressure gauges</b>	23/02	<ul style="list-style-type: none"> <li>mechanically indicating or recording and involving loaded or return springs</li> </ul>
19/02	<ul style="list-style-type: none"> <li>Arrangements for preventing, or for compensating for, effects of inclination or acceleration of the measuring device; Zero-setting means (for aneroid barometers G01L 7/14)</li> </ul>	23/04	<ul style="list-style-type: none"> <li>involving means subjected to known counteracting pressure</li> </ul>
19/04	<ul style="list-style-type: none"> <li>Means for compensating for effects of changes of temperature</li> </ul>	23/06	<ul style="list-style-type: none"> <li>Indicating or recording by optical means</li> </ul>
19/06	<ul style="list-style-type: none"> <li>Means for preventing overload or deleterious influence of the measured medium on the measuring device or <u>vice versa</u></li> </ul>	23/08	<ul style="list-style-type: none"> <li>operated electrically</li> </ul>
19/08	<ul style="list-style-type: none"> <li>Means for indicating or recording, e.g. for remote indication</li> </ul>	23/10	<ul style="list-style-type: none"> <li>by pressure-sensitive members of the piezo-electric type</li> </ul>
19/10	<ul style="list-style-type: none"> <li>mechanical</li> </ul>	23/12	<ul style="list-style-type: none"> <li>by changing capacitance or inductance</li> </ul>
19/12	<ul style="list-style-type: none"> <li>Alarms or signals</li> </ul>	23/14	<ul style="list-style-type: none"> <li>by electromagnetic elements</li> </ul>
19/14	<ul style="list-style-type: none"> <li>Housings</li> </ul>	23/16	<ul style="list-style-type: none"> <li>by photoelectric means</li> </ul>
19/16	<ul style="list-style-type: none"> <li>Dials; Mounting of dials</li> </ul>	23/18	<ul style="list-style-type: none"> <li>by resistance strain gauges</li> </ul>
21/00	<b>Vacuum gauges</b>	23/20	<ul style="list-style-type: none"> <li>combined with planimeters or integrators</li> </ul>
21/02	<ul style="list-style-type: none"> <li>having a compression chamber in which gas, whose pressure is to be measured, is compressed</li> </ul>	23/22	<ul style="list-style-type: none"> <li>for detecting or indicating knocks in internal-combustion engines; Units comprising pressure-sensitive members combined with ignitors for firing internal-combustion engines</li> </ul>
21/04	<ul style="list-style-type: none"> <li>wherein the chamber is closed by liquid; Vacuum gauges of the McLeod type</li> </ul>	23/24	<ul style="list-style-type: none"> <li>for measuring pressure in inlet or exhaust ducts of internal-combustion engines</li> </ul>
21/06	<ul style="list-style-type: none"> <li>actuated by rotating or inverting the measuring device</li> </ul>	23/26	<ul style="list-style-type: none"> <li>Details or accessories</li> </ul>
21/08	<ul style="list-style-type: none"> <li>by measuring variations in the transmission of acoustic waves through the medium, the pressure of which is to be measured</li> </ul>	23/28	<ul style="list-style-type: none"> <li>Cooling means</li> </ul>
21/10	<ul style="list-style-type: none"> <li>by measuring variations in the heat conductivity of the medium, the pressure of which is to be measured</li> </ul>	23/30	<ul style="list-style-type: none"> <li>Means for indicating consecutively positions of pistons or cranks of internal-combustion engines in combination with pressure indicators</li> </ul>
21/12	<ul style="list-style-type: none"> <li>measuring changes in electric resistance of measuring members, e.g. of filaments; Vacuum gauges of the Pirani type</li> </ul>	23/32	<ul style="list-style-type: none"> <li>Apparatus specially adapted for recording pressure changes measured by indicators</li> </ul>
21/14	<ul style="list-style-type: none"> <li>using thermocouples</li> </ul>	25/00	<b>Testing or calibrating of apparatus for measuring force, torque, work, mechanical power, or mechanical efficiency [2]</b>
21/16	<ul style="list-style-type: none"> <li>by measuring variation of frictional resistance of gases</li> </ul>	27/00	<b>Testing or calibrating of apparatus for measuring fluid pressure [2]</b>
		27/02	<ul style="list-style-type: none"> <li>of indicators</li> </ul>

# **G01M TESTING STATIC OR DYNAMIC BALANCE OF MACHINES OR STRUCTURES; TESTING OF STRUCTURES OR APPARATUS, NOT OTHERWISE PROVIDED FOR**

## **Note(s)**

Attention is drawn to the Notes following the title of class G01.

## **Subclass index**

TESTING STATIC OR DYNAMIC BALANCE OF MACHINES OR STRUCTURES.....	1/00
INVESTIGATING FLUID-TIGHTNESS; ELASTICITY.....	3/00, 5/00
VIBRATION- OR SHOCK-TESTING.....	7/00
SPECIAL APPLICATIONS	
Aerodynamic; hydrodynamic testing.....	9/00, 10/00
Optical testing.....	11/00
Mechanical or engine testing.....	13/00, 15/00, 17/00
SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....	99/00

<b>1/00 Testing static or dynamic balance of machines or structures</b>	3/10 • • • • for containers, e.g. radiators
1/02 • Details of balancing machines or devices	3/12 • • • • by observing elastic covers or coatings, e.g. soapy water
1/04 • • Adaptation of bearing support assemblies for receiving the body to be tested	3/14 • • • • for pipes, cables, or tubes; for pipe joints or seals; for valves
1/06 • • Adaptation of drive assemblies for receiving the body to be tested	3/16 • • • • using electric detection means (G01M 3/06, G01M 3/12, G01M 3/20, G01M 3/24, G01M 3/26 take precedence)
1/08 • • Instruments for indicating directly the magnitude and phase of the unbalance	3/18 • • • • for pipes, cables, or tubes; for pipe joints or seals; for valves
1/10 • Determining the moment of inertia	3/20 • • • • using special tracer materials, e.g. dye, fluorescent material, radioactive material
1/12 • Static balancing; Determining position of centre of gravity (by determining unbalance G01M 1/14)	3/22 • • • • for pipes, cables, or tubes; for pipe joints or seals; for valves
1/14 • Determining unbalance (G01M 1/30, G01M 1/38 take precedence)	3/24 • • • • using infrasonic, sonic, or ultrasonic vibrations
1/16 • • by oscillating or rotating the body to be tested	3/26 • • • • by measuring rate of loss or gain of fluid, e.g. by pressure-responsive devices, by flow detectors [2]
1/18 • • • and running the body down from a speed greater than normal	3/28 • • • • for pipes, cables, or tubes; for pipe joints or seals; for valves [2]
1/20 • • • and applying external forces compensating forces due to unbalance	3/30 • • • • using progressive displacement of one fluid by another [2]
1/22 • • • and converting vibrations due to unbalance into electric variables	3/32 • • • • for containers, e.g. radiators [2]
1/24 • • • Performing balancing on elastic shafts, e.g. for crankshafts	3/34 • • • • by testing the possibility of maintaining the vacuum in containers, e.g. in can-testing machines [2]
1/26 • • • with special adaptations for marking, e.g. by drilling	3/36 • • • • by detecting change in dimensions of the structure being tested
1/28 • • • with special adaptations for determining unbalance of the body <i>in situ</i> , e.g. of vehicle wheels	3/38 • • • • by using light (G01M 3/02 takes precedence)
1/30 • Compensating unbalance (G01M 1/38 takes precedence)	3/40 • • • • by using electric means, e.g. by observing electric discharges
1/32 • • by adding material to the body to be tested, e.g. by correcting-weights	<b>5/00 Investigating the elasticity of structures, e.g. deflection of bridges or aircraft wings</b> (G01M 9/00 takes precedence)
1/34 • • by removing material from the body to be tested, e.g. from the tread of tyres	<b>7/00 Vibration-testing of structures; Shock-testing of structures</b> (G01M 9/00 takes precedence)
1/36 • • by adjusting position of masses built-in the body to be tested	7/02 • • • • Vibration-testing [5]
1/38 • Combined machines or devices for both determining and correcting unbalance	7/04 • • • • Monodirectional test stands [5]
<b>3/00 Investigating fluid tightness of structures</b>	7/06 • • • • Multidirectional test stands [5]
3/02 • by using fluid or vacuum	7/08 • • • • Shock-testing [5]
3/04 • • by detecting the presence of fluid at the leakage point	<b>9/00 Aerodynamic testing; Arrangements in or on wind tunnels</b>
3/06 • • • by observing bubbles in a liquid pool	9/02 • • • • Wind tunnels [5]
3/08 • • • • for pipes, cables, or tubes; for pipe joints or seals; for valves	9/04 • • • • Details [5]

## G01M

9/06	• Measuring arrangements specially adapted for aerodynamic testing [5]	15/06	• • by monitoring positions of pistons or cranks [2006.01]
9/08	• Aerodynamic models [5]	15/08	• • by monitoring pressure in cylinders [2006.01]
10/00	<b>Hydrodynamic testing; Arrangements in or on ship-testing tanks or water tunnels</b>	15/09	• • by monitoring pressure in fluid ducts, e.g. in lubrication or cooling parts [2006.01]
11/00	<b>Testing of optical apparatus; Testing structures by optical methods not otherwise provided for</b>	15/10	• • by monitoring exhaust gases [2006.01]
11/02	• Testing of optical properties	15/11	• • by detecting misfire [2006.01]
11/04	• • Optical benches	15/12	• • by monitoring vibrations [2006.01]
11/06	• • Testing of alignment of vehicle head-light devices	15/14	• Testing of gas-turbine plants or jet-propulsion plants [2006.01]
11/08	• Testing of mechanical properties	17/00	<b>Testing of vehicles</b> (G01M 15/00 takes precedence; testing fluid tightness G01M 3/00; testing elastic properties of bodies or chassis, e.g. torsion-testing, G01M 5/00; testing alignment of vehicle head-lighting devices G01M 11/06)
13/00	<b>Testing of machine parts</b>	17/007	• of wheeled or endless-tracked vehicles (G01M 17/08 takes precedence) [6]
13/02	• Testing of gearing or of transmission mechanisms	17/013	• • of wheels [6]
13/04	• Testing of bearings	17/02	• • of tyres [6]
15/00	<b>Testing of engines [4]</b>	17/03	• • of endless-tracks [6]
15/02	• Details or accessories of testing apparatus [2006.01]	17/04	• • of suspension or of damping [6]
15/04	• Testing of internal-combustion engines, e.g. diagnostic testing of piston engines [2006.01]	17/06	• • of steering behaviour; of rolling behaviour [6]
15/05	• • by combined monitoring of two or more different engine parameters [2006.01]	17/08	• of railway vehicles [6]
	<b>Note(s) [2006.01]</b>	17/10	• • of suspensions, axles or wheels [6]
	Group G01M 15/05 takes precedence over groups G01M 15/06-G01M 15/12.	99/00	<b>Subject matter not provided for in other groups of this subclass [2011.01]</b>

## G01N INVESTIGATING OR ANALYSING MATERIALS BY DETERMINING THEIR CHEMICAL OR PHYSICAL PROPERTIES (measuring or testing processes other than immunoassay, involving enzymes or micro-organisms C12M, C12Q)

### Note(s)

- In this subclass, the following terms are used with the meanings indicated:
  - "investigating" means testing or determining;
  - "materials" includes solid, liquid or gaseous media, e.g. the atmosphere.
- Attention is drawn to the Notes following the title of class G01.
- Investigating the properties of materials, specially adapted for use in processes covered by subclass B23K, is classified in group B23K 31/12.

### Subclass index

SAMPLING, PREPARING.....	1/00
INVESTIGATING OR ANALYSING CHARACTERISED BY THE PROPERTY INVESTIGATED	
Mechanical strength; density; flow.....	3/00, 9/00, 11/00
Surface or boundary effects; characteristics of particles, permeability; friction, adhesive force.....	13/00, 15/00, 19/00
Resistance to atmospheric agents.....	17/00
INVESTIGATING OR ANALYSING CHARACTERISED BY THE METHOD USED	
Weighing; measuring pressure or volume of gas; mechanical.....	5/00, 7/00, 19/00
Optical; by microwaves; by radiation.....	21/00, 22/00, 23/00
Magnetic resonance or other spin effects.....	24/00
Thermal; electric, electrochemical, magnetic; sonic.....	25/00, 27/00, 29/00
By separation into components; by the use of the chemical methods.....	30/00, 31/00
OTHER INVESTIGATING OR ANALYSING CHARACTERISED BY THE MATERIAL INVESTIGATED.....	33/00
Immunoassay.....	33/53
AUTOMATIC ANALYSIS.....	35/00
DETAILS NOT COVERED BY THE PRECEDING GROUPS.....	37/00

1/00	<b>Sampling; Preparing specimens for investigation</b> (handling materials for automatic analysis G01N 35/00)	1/08	• • • involving an extracting tool, e.g. core bit
1/02	• Devices for withdrawing samples	1/10	• • in the liquid or fluent state
1/04	• • in the solid state, e.g. by cutting	1/12	• • • Dippers; Dredgers [5]
1/06	• • • providing a thin slice, e.g. microtome	1/14	• • • Suction devices, e.g. pumps; Ejector devices

- 1/16 • • • with provision for intake at several levels (G01N 1/12, G01N 1/14 take precedence)
- 1/18 • • • with provision for splitting samples into portions (G01N 1/12, G01N 1/14 take precedence; fraction-collection apparatus for chromatography B01D 15/08)
- 1/20 • • • for flowing or falling materials (G01N 1/12, G01N 1/14 take precedence)
- 1/22 • • in the gaseous state
- 1/24 • • • Suction devices
- 1/26 • • • with provision for intake from several spaces
- 1/28 • Preparing specimens for investigation (mounting specimens on microscopic slides G02B 21/34; means for supporting the objects or the materials to be analysed in electron microscopes H01J 37/20)
- 1/30 • • Staining; Impregnating
- 1/31 • • • Apparatus therefor [6]
- 1/32 • • Polishing; Etching
- 1/34 • • Purifying; Cleaning
- 1/36 • • Embedding or analogous mounting of samples [6]
- 1/38 • • Diluting, dispersing or mixing samples [6]
- 1/40 • • Concentrating samples [6]
- 1/42 • • Low-temperature sample treatment, e.g. cryofixation [6]
- 1/44 • • Sample treatment involving radiation, e.g. heat [6]

### 3/00 Investigating strength properties of solid materials by application of mechanical stress

#### Note(s)

This group covers the stressing of materials not only below but also beyond the elastic limit, e.g. until breaking occurs.

- 3/02 • Details
- 3/04 • • Chucks
- 3/06 • • Special adaptations of indicating or recording means
- 3/08 • by applying steady tensile or compressive forces (G01N 3/28 takes precedence)
- 3/10 • • generated by pneumatic or hydraulic pressure (G01N 3/18 takes precedence)
- 3/12 • • • Pressure-testing
- 3/14 • • generated by dead weight, e.g. pendulum; generated by spring tension (G01N 3/18 takes precedence)
- 3/16 • • applied through gearing (G01N 3/18 takes precedence)
- 3/18 • • Performing tests at high or low temperatures
- 3/20 • by applying steady bending forces (G01N 3/26, G01N 3/28 take precedence)
- 3/22 • by applying steady torsional forces (G01N 3/26, G01N 3/28 take precedence)
- 3/24 • by applying steady shearing forces (G01N 3/26, G01N 3/28 take precedence)
- 3/26 • Investigating twisting or coiling properties
- 3/28 • Investigating ductility, e.g. suitability of sheet metal for deep-drawing or spinning
- 3/30 • by applying a single impulsive force (investigating hardness by performing impressions under impulsive load G01N 3/48)
- 3/303 • • generated only by free-falling weight [7]
- 3/307 • • generated by a compressed or tensile-stressed spring; generated by pneumatic or hydraulic means [7]
- 3/31 • • generated by a rotating fly-wheel [7]
- 3/313 • • generated by explosives [7]

- 3/317 • • generated by electromagnetic means [7]
- 3/32 • by applying repeated or pulsating forces
- 3/34 • • generated by mechanical means, e.g. hammer blows
- 3/36 • • generated by pneumatic or hydraulic means
- 3/38 • • generated by electromagnetic means
- 3/40 • Investigating hardness or rebound hardness
- 3/42 • • by performing impressions under a steady load by indentors, e.g. sphere, pyramid (G01N 3/54 takes precedence)
- 3/44 • • • the indentors being put under a minor load and a subsequent major load, i.e. Rockwell system
- 3/46 • • • the indentors performing a scratching movement
- 3/48 • • by performing impressions under impulsive load by indentors, e.g. falling ball (G01N 3/54 takes precedence)
- 3/50 • • by measuring rolling friction, e.g. by rocking pendulum (G01N 3/54 takes precedence)
- 3/52 • • by measuring extent of rebound of a striking body (G01N 3/54 takes precedence)
- 3/54 • • Performing tests at high or low temperatures
- 3/56 • Investigating resistance to wear or abrasion
- 3/58 • Investigating machinability by cutting tools; Investigating the cutting ability of tools
- 3/60 • Investigating resistance of materials, e.g. refractory materials, to rapid heat changes
- 3/62 • Manufacturing, calibrating, or repairing devices used in investigations covered by the preceding subgroups

### 5/00 Analysing materials by weighing, e.g. weighing small particles separated from a gas or liquid (G01N 9/00 takes precedence)

- 5/02 • by absorbing or adsorbing components of a material and determining change of weight of the adsorbent, e.g. determining moisture content
- 5/04 • by removing a component, e.g. by evaporation, and weighing the remainder

### 7/00 Analysing materials by measuring the pressure or volume of a gas or vapour

- 7/02 • by absorption, adsorption, or combustion of components and measurement of the change in pressure or volume of the remainder
- 7/04 • • by absorption or adsorption alone
- 7/06 • • by combustion alone
- 7/08 • • by combustion followed by absorption or adsorption of the combustion products
- 7/10 • by allowing diffusion of components through a porous wall and measuring a pressure or volume difference
- 7/12 • • the diffusion being followed by combustion or catalytic oxidation
- 7/14 • by allowing the material to emit a gas or vapour, e.g. water vapour, and measuring a pressure or volume difference
- 7/16 • • by heating the material
- 7/18 • • by allowing the material to react
- 7/20 • • • the reaction being fermentation
- 7/22 • • • • of dough

### 9/00 Investigating density or specific gravity of materials; Analysing materials by determining density or specific gravity

- 9/02 • by measuring weight of a known volume
- 9/04 • • of fluids

- 9/06 • • • with continuous circulation through a pivotally-supported member
- 9/08 • by measuring buoyant force of solid materials by weighing both in air and in a liquid
- 9/10 • by observing bodies wholly or partially immersed in fluid materials
- 9/12 • • by observing the depth of immersion of the bodies, e.g. hydrometers
- 9/14 • • • the body being built into a container
- 9/16 • • • the body being pivoted
- 9/18 • • • Special adaptations for indicating, recording, or control
- 9/20 • • by balancing the weight of the bodies
- 9/22 • • • with continuous circulation of the fluid
- 9/24 • by observing the transmission of wave or particle radiation through the material
- 9/26 • by measuring pressure differences
- 9/28 • • by measuring the blowing pressure of gas bubbles escaping from nozzles at different depths in a liquid
- 9/30 • by using centrifugal effects
- 9/32 • by using flow properties of fluids, e.g. flow through tubes or apertures
- 9/34 • • by using elements moving through the fluid, e.g. vane
- 9/36 • Analysing materials by measuring the density or specific gravity, e.g. determining quantity of moisture (methods of measurement G01N 9/02-G01N 9/32)
- 11/00 Investigating flow properties of materials, e.g. viscosity, plasticity; Analysing materials by determining flow properties**
- 11/02 • by measuring flow of the material
- 11/04 • • through a restricted passage, e.g. tube, aperture
- 11/06 • • • by timing the outflow of a known quantity
- 11/08 • • • by measuring pressure required to produce a known flow
- 11/10 • by moving a body within the material
- 11/12 • • by measuring rising or falling speed of the body; by measuring penetration of wedged gauges (G01N 11/16 takes precedence)
- 11/14 • • by using rotary bodies, e.g. vane (G01N 11/16 takes precedence)
- 11/16 • • by measuring damping effect upon oscillatory body
- 13/00 Investigating surface or boundary effects, e.g. wetting power; Investigating diffusion effects; Analysing materials by determining surface, boundary, or diffusion effects** (scanning-probe techniques or apparatus G01Q) [1, 7]
- 13/02 • Investigating surface tension of liquids
- 13/04 • Investigating osmotic effects
- 15/00 Investigating characteristics of particles; Investigating permeability, pore-volume or surface-area of porous materials** (identification of micro-organisms C12Q) [4]
- 15/02 • Investigating particle size or size distribution (G01N 15/04, G01N 15/10 take precedence; by measuring osmotic pressure G01N 7/10) [4]
- 15/04 • Investigating sedimentation of particle suspensions
- 15/05 • • in blood [4]
- 15/06 • Investigating concentration of particle suspensions (G01N 15/04, G01N 15/10 take precedence; by weighing G01N 5/00) [3]
- 15/08 • Investigating permeability, pore volume, or surface area of porous materials
- 15/10 • Investigating individual particles [4]
- 15/12 • • Coulter-counters [4]
- 15/14 • • Electro-optical investigation [4]
- 17/00 Investigating resistance of materials to the weather, to corrosion, or to light**
- 17/02 • Electrochemical measuring systems for weathering, corrosion or corrosion-protection measurement (G01N 17/04 takes precedence) [5]
- 17/04 • Corrosion probes [5]
- 19/00 Investigating materials by mechanical methods** (G01N 3/00-G01N 17/00 take precedence)
- 19/02 • Measuring coefficient of friction between materials
- 19/04 • Measuring adhesive force between materials, e.g. of sealing tape, of coating
- 19/06 • Investigating by removing material, e.g. spark-testing
- 19/08 • Detecting presence of flaws or irregularities
- 19/10 • Measuring moisture content, e.g. by measuring change in length of hygroscopic filament; Hygrometers
- 21/00 Investigating or analysing materials by the use of optical means, i.e. using infra-red, visible or ultra-violet light** (G01N 3/00-G01N 19/00 take precedence)
- Note(s)**
- This group does not cover the investigation of spectral properties of light per se, or measurements of the properties of materials where spectral properties of light are sensed and primary emphasis is placed on creating, detecting or analysing the spectrum providing that the properties of the materials to be investigated are of minor importance (see also Note (4) after the title of class G01). Those subjects are covered by group G01J 3/00.
- 21/01 • Arrangements or apparatus for facilitating the optical investigation [3]
- 21/03 • • Cuvette constructions [3]
- 21/05 • • • Flow-through cuvettes (G01N 21/09 takes precedence) [3]
- 21/07 • • • Centrifugal type cuvettes (G01N 21/09 takes precedence) [3]
- 21/09 • • • adapted to resist hostile environments or corrosive or abrasive materials [3]
- 21/11 • • Filling or emptying of cuvettes [3]
- 21/13 • • Moving of cuvettes or solid samples to or from the investigating station [3]
- 21/15 • • Preventing contamination of the components of the optical system or obstruction of the light path [3]
- 21/17 • Systems in which incident light is modified in accordance with the properties of the material investigated (where the material investigated is optically excited causing a change in wavelength of the incident light G01N 21/63) [3]
- 21/19 • • Dichroism [3]
- 21/21 • • Polarisation-affecting properties (G01N 21/19 takes precedence) [3]
- 21/23 • • • Bi-refrindex [3]
- 21/25 • • Colour; Spectral properties, i.e. comparison of effect of material on the light at two or more different wavelengths or wavelength bands [3]
- 21/27 • • • using photo-electric detection (G01N 21/31 takes precedence) [3]

- 21/29 • • • using visual detection (G01N 21/31 takes precedence) [3]
- 21/31 • • • Investigating relative effect of material at wavelengths characteristic of specific elements or molecules, e.g. atomic absorption spectrometry [3]
- 21/33 • • • • using ultra-violet light (G01N 21/39 takes precedence) [3]
- 21/35 • • • • using infra-red light (G01N 21/39 takes precedence) [3, 2014.01]
- 21/3504 • • • • • for analysing gases, e.g. multi-gas analysis [2014.01]
- 21/3518 • • • • • • Devices using gas filter correlation techniques; Devices using gas pressure modulation techniques [2014.01]
- Note(s) [2014.01]**  
This group also covers devices without instrumental sources, e.g. radiometric-type devices using ambient infra-red light.
- 21/3554 • • • • • for determining moisture content [2014.01]
- 21/3559 • • • • • • in sheets, e.g. in paper [2014.01]
- 21/3563 • • • • • for analysing solids; Preparation of samples therefor [2014.01]
- 21/3577 • • • • • for analysing liquids, e.g. polluted water [2014.01]
- 21/3581 • • • • • using far infra-red light; using Terahertz radiation [2014.01]
- 21/3586 • • • • • • by Terahertz time domain spectroscopy [THz-TDS] [2014.01]
- 21/359 • • • • • using near infra-red light [2014.01]
- 21/37 • • • • • using pneumatic detection [3]
- 21/39 • • • • using tunable lasers [3]
- 21/41 • • Refractivity; Phase-affecting properties, e.g. optical path length (G01N 21/21 takes precedence) [3]
- 21/43 • • • by measuring critical angle [3]
- 21/45 • • • using interferometric methods; using Schlieren methods [3]
- 21/47 • • Scattering, i.e. diffuse reflection (G01N 21/25, G01N 21/41 take precedence) [3]
- 21/49 • • • within a body or fluid [3]
- 21/51 • • • • inside a container, e.g. in an ampoule (G01N 21/53 takes precedence) [3]
- 21/53 • • • • within a flowing fluid, e.g. smoke [3]
- 21/55 • • Specular reflectivity [3, 2014.01]
- 21/552 • • • Attenuated total reflection [2014.01]
- 21/57 • • • Measuring gloss [3]
- 21/59 • • Transmissivity (G01N 21/25 takes precedence) [3]
- 21/61 • • • Non-dispersive gas analysers [3]
- 21/62 • Systems in which the material investigated is excited whereby it emits light or causes a change in wavelength of the incident light [3]
- 21/63 • • optically excited [3]
- 21/64 • • • Fluorescence; Phosphorescence [3]
- 21/65 • • • Raman scattering [3]
- 21/66 • • electrically excited, e.g. electroluminescence [3]
- 21/67 • • • using electric arcs or discharges [3]
- 21/68 • • • using high frequency electric fields [3]
- 21/69 • • • specially adapted for fluids [3]
- 21/70 • • mechanically excited, e.g. triboluminescence [3]
- 21/71 • • thermally excited [3]
- 21/72 • • • using flame burners [3]
- 21/73 • • • using plasma burners or torches [3]
- 21/74 • • • using flameless atomising, e.g. graphite furnaces [3]
- 21/75 • Systems in which material is subjected to a chemical reaction, the progress or the result of the reaction being investigated (systems in which material is burnt in a flame or plasma G01N 21/72, G01N 21/73) [3]
- 21/76 • • Chemiluminescence; Bioluminescence [3]
- 21/77 • • by observing the effect on a chemical indicator [3]
- 21/78 • • • producing a change of colour [3]
- 21/79 • • • • Photometric titration [3]
- 21/80 • • • • Indicating pH value [3]
- 21/81 • • • • Indicating humidity [3]
- 21/82 • • • producing a precipitate or turbidity [3]
- 21/83 • • • • Turbidimetric titration [3]
- 21/84 • Systems specially adapted for particular applications [3]
- 21/85 • • Investigating moving fluids or granular solids [3]
- 21/86 • • Investigating moving sheets (G01N 21/89 takes precedence) [3]
- 21/87 • • Investigating jewels (G01N 21/88 takes precedence) [3]
- 21/88 • • Investigating the presence of flaws, defects or contamination [3]
- 21/89 • • • in moving material, e.g. paper, textiles (G01N 21/90, G01N 21/91, G01N 21/94 take precedence) [3, 7]
- 21/892 • • • • characterised by the flaw, defect or object feature examined [7]
- 21/894 • • • • • Pinholes [7]
- 21/896 • • • • • Optical defects in or on transparent materials, e.g. distortion, surface flaws [7]
- 21/898 • • • • • Irregularities in textured or patterned surfaces, e.g. textiles, wood [7]
- 21/90 • • • in a container or its contents (G01N 21/91 takes precedence) [3]
- 21/91 • • • using penetration of dyes, e.g. fluorescent ink [3]
- 21/93 • • • Detection standards; Calibrating [7]
- 21/94 • • • Investigating contamination, e.g. dust (G01N 21/85 takes precedence) [7]
- 21/95 • • • characterised by the material or shape of the object to be examined (G01N 21/89- G01N 21/91, G01N 21/94 take precedence) [7]
- 21/952 • • • • Inspecting the exterior surface of cylindrical bodies or wires (G01N 21/956 takes precedence) [7]
- 21/954 • • • • Inspecting the inner surface of hollow bodies, e.g. bores [7]
- 21/956 • • • • Inspecting patterns on the surface of objects [7]
- 21/958 • • • • Inspecting transparent materials [7]
- 22/00 Investigating or analysing materials by the use of microwaves** (G01N 3/00-G01N 17/00, G01N 24/00 take precedence) [3]
- 22/02 • Investigating the presence of flaws [3]
- 22/04 • Investigating moisture content [3]
- 23/00 Investigating or analysing materials by the use of wave or particle radiation not covered by group G01N 21/00 or G01N 22/00, e.g. X-rays, neutrons** (G01N 3/00-G01N 17/00 take precedence)
- 23/02 • by transmitting the radiation through the material
- 23/04 • • and forming a picture
- 23/05 • • • using neutrons [3]
- 23/06 • • and measuring the absorption

- 23/08 • • • using electric detection means
- 23/083 • • • • the radiation being X-rays (G01N 23/10-G01N 23/18 take precedence) [5]
- 23/087 • • • • • using polyenergetic X-rays [5]
- 23/09 • • • • the radiation being neutrons [3]
- 23/10 • • • • the material being confined in a container (G01N 23/09 takes precedence) [3]
- 23/12 • • • • the material being a flowing fluid or a flowing granular solid (G01N 23/09 takes precedence) [3]
- 23/14 • • • • • specially adapted for controlling or monitoring operations or for signalling
- 23/16 • • • • the material being a moving sheet (G01N 23/09, G01N 23/18 take precedence) [3]
- 23/18 • • • • Investigating the presence of flaws or inclusions (G01N 23/09 takes precedence) [3, 5]
- 23/20 • by using diffraction of the radiation, e.g. for investigating crystal structure; by using reflection of the radiation
- 23/201 • • by measuring small-angle scattering [2]
- 23/202 • • • using neutrons [3]
- 23/203 • • by measuring back scattering [2]
- 23/204 • • • using neutrons [3]
- 23/205 • • by means of diffraction cameras (G01N 23/201 takes precedence) [2]
- 23/206 • • • the radiation being neutrons [3]
- 23/207 • • by means of diffractometry using detectors, e.g. using an analysing crystal or a crystal to be analysed in a central position and one or more displaceable detectors in circumferential positions (G01N 23/201 takes precedence) [2]
- 23/22 • by measuring secondary emission [2]
- 23/221 • • by activation analysis [2]
- 23/222 • • • using neutrons [3]
- 23/223 • • by irradiating the sample with X-rays and by measuring X-ray fluorescence [2]
- 23/225 • • using electron or ion microprobe [2]
- 23/227 • • by measuring photoelectric effect, e.g. Auger electrons [2]
- 24/00 Investigating or analysing materials by the use of nuclear magnetic resonance, electron paramagnetic resonance or other spin effects [3, 4, 5]**
- 24/08 • by using nuclear magnetic resonance (G01N 24/12 takes precedence) [3]
- 24/10 • by using electron paramagnetic resonance (G01N 24/12 takes precedence) [3]
- 24/12 • by using double resonance [3]
- 24/14 • by using cyclotron resonance [3]
- 25/00 Investigating or analysing materials by the use of thermal means (G01N 3/00-G01N 23/00 take precedence)**
- 25/02 • by investigating changes of state or changes of phase; by investigating sintering
- 25/04 • • of melting point; of freezing point; of softening point
- 25/06 • • • Analysis by measuring change of freezing point
- 25/08 • • of boiling point
- 25/10 • • • Analysis by measuring change of boiling point
- 25/12 • • of critical point; of other phase change
- 25/14 • by using distillation, extraction, sublimation, condensation, freezing, or crystallisation (G01N 25/02 takes precedence)
- 25/16 • by investigating thermal coefficient of expansion
- 25/18 • by investigating thermal conductivity (by calorimetry G01N 25/20; by measuring change of resistance of an electrically-heated body G01N 27/18)
- 25/20 • by investigating the development of heat, i.e. calorimetry, e.g. by measuring specific heat, by measuring thermal conductivity
- 25/22 • • on combustion or catalytic oxidation, e.g. of components of gas mixtures
- 25/24 • • • using combustion tubes, e.g. for micro-analysis
- 25/26 • • • using combustion with oxygen under pressure, e.g. in bomb calorimeter
- 25/28 • • • the rise in temperature of the gases resulting from combustion being measured directly
- 25/30 • • • • using electric temperature-responsive elements
- 25/32 • • • • • using thermoelectric elements
- 25/34 • • • • using mechanical temperature-responsive elements, e.g. bimetallic
- 25/36 • • • • • for investigating the composition of gas mixtures
- 25/38 • • • • using the melting or combustion of a solid
- 25/40 • • • the heat developed being transferred to a flowing fluid
- 25/42 • • • • continuously
- 25/44 • • • the heat developed being transferred to a fixed quantity of fluid
- 25/46 • • • • for investigating the composition of gas mixtures
- 25/48 • • on solution, sorption, or a chemical reaction not involving combustion or catalytic oxidation
- 25/50 • by investigating flash-point; by investigating explosibility
- 25/52 • • by determining flash-point of liquids
- 25/54 • • by determining explosibility
- 25/56 • by investigating moisture content
- 25/58 • • by measuring changes of properties of the material due to heat, cold, or expansion
- 25/60 • • • for determining the wetness of steam
- 25/62 • • by psychrometric means, e.g. wet-and-dry-bulb thermometers
- 25/64 • • • using electric temperature-responsive elements
- 25/66 • • by investigating dew-point
- 25/68 • • • by varying the temperature of a condensing surface
- 25/70 • • • by varying the temperature of the material, e.g. by compression, by expansion
- 25/72 • Investigating presence of flaws
- 27/00 Investigating or analysing materials by the use of electric, electro-chemical, or magnetic means (G01N 3/00-G01N 25/00 take precedence; measurement or testing of electric or magnetic variables or of electric or magnetic properties of materials G01R)**
- 27/02 • by investigating impedance
- 27/04 • • by investigating resistance
- 27/06 • • • of a liquid (involving electrolysis G01N 27/26)
- 27/07 • • • • Construction of measuring vessels; Electrodes therefor [2]
- 27/08 • • • • which is flowing continuously
- 27/10 • • • • • Investigation or analysis specially adapted for controlling or monitoring operations or for signalling
- 27/12 • • • of a solid body in dependence upon absorption of a fluid; of a solid body in dependence upon reaction with a fluid

- 27/14 • • • of an electrically-heated body in dependence upon change of temperature
- 27/16 • • • • caused by burning or catalytic oxidation of surrounding material to be tested, e.g. of gas
- 27/18 • • • • caused by changes in the thermal conductivity of a surrounding material to be tested (G01N 27/20 takes precedence)
- 27/20 • • • Investigating the presence of flaws
- 27/22 • • by investigating capacitance
- 27/24 • • • Investigating the presence of flaws
- 27/26 • by investigating electrochemical variables; by using electrolysis or electrophoresis [5]
- 27/27 • • Association of two or more measuring systems or cells, each measuring a different parameter, where the measurement results may be either used independently, the systems or cells being physically associated, or combined to produce a value for a further parameter [5]
- 27/28 • • Electrolytic cell components
- 27/30 • • • Electrodes, e.g. test electrodes; Half-cells (G01N 27/414 takes precedence) [5]
- 27/31 • • • • Half-cells with permeable membranes, e.g. semi-porous or perm-selective membranes [5]
- 27/32 • • • • Calomel electrodes
- 27/327 • • • • Biochemical electrodes [5]
- 27/333 • • • • Ion-selective electrodes or membranes (glass electrodes G01N 27/36) [5]
- 27/34 • • • • Dropping-mercury electrodes
- 27/36 • • • • Glass electrodes
- 27/38 • • • • Cleaning of electrodes
- 27/40 • • • Semi-permeable membranes or partitions
- 27/401 • • • Salt-bridge leaks; Liquid junctions [5]
- 27/403 • • Cells and electrode assemblies [5]
- 27/404 • • • Cells with anode, cathode and cell electrolyte on the same side of a permeable membrane which separates them from the sample fluid [5]
- 27/406 • • • Cells and probes with solid electrolytes [5]
- 27/407 • • • • for investigating or analysing gases [5]
- 27/409 • • • • • Oxygen concentration cells [5]
- 27/41 • • • • • Oxygen pumping cells [5]
- 27/411 • • • • for investigating or analysing of liquid metals [5]
- 27/413 • • • Concentration cells using liquid electrolytes [5]
- 27/414 • • • Ion-sensitive or chemical field-effect transistors, i.e. ISFETS or CHEMFETS [5]
- 27/416 • • Systems (G01N 27/27 takes precedence) [5]
- 27/417 • • • using cells and probes with solid electrolytes [5]
- 27/419 • • • • Measuring voltages or currents with a combination of oxygen pumping cells and oxygen concentration cells [5]
- 27/42 • • • Measuring deposition or liberation of materials from an electrolyte; Coulometry, i.e. measuring coulomb-equivalent of material in an electrolyte [5]
- 27/44 • • • • using electrolysis to generate a reagent, e.g. for titration [5]
- 27/447 • • • using electrophoresis [5]
- 27/453 • • • • Cells therefor [5]
- 27/48 • • • using polarography, i.e. measuring changes in current under a slowly-varying voltage
- 27/49 • • • Systems involving the determination of the current at a single specific value, or small range of values, of applied voltage for producing selective measurement of one or more particular ionic species [5]
- 27/60 • by investigating electrostatic variables
- 27/61 • • Investigating the presence of flaws [3]
- 27/62 • by investigating the ionisation of gases; by investigating electric discharges, e.g. emission of cathode
- 27/64 • • using wave or particle radiation to ionise a gas, e.g. in an ionisation chamber
- 27/66 • • • and measuring current or voltage
- 27/68 • • using electric discharge to ionise a gas
- 27/70 • • • and measuring current or voltage
- 27/72 • by investigating magnetic variables
- 27/74 • • of fluids (G01N 24/00 takes precedence)
- 27/76 • • • by investigating susceptibility
- 27/80 • • for investigating mechanical hardness, e.g. by investigating saturation or remanence of ferromagnetic material
- 27/82 • • for investigating the presence of flaws
- 27/83 • • • by investigating stray magnetic fields [3]
- 27/84 • • • • by applying magnetic powder or magnetic ink [3]
- 27/85 • • • • using magnetographic methods [3]
- 27/87 • • • • using probes [3]
- 27/90 • • • using eddy currents [3]
- 27/92 • by investigating breakdown voltage (G01N 27/60, G01N 27/62 take precedence) [3]
- 29/00 Investigating or analysing materials by the use of ultrasonic, sonic or infrasonic waves; Visualisation of the interior of objects by transmitting ultrasonic or sonic waves through the object (G01N 3/00-G01N 27/00 take precedence) [4]**
- 29/02 • Analysing fluids (using acoustic emission techniques G01N 29/14) [5, 2006.01]
- 29/024 • • by measuring propagation velocity or propagation time of acoustic waves [2006.01]
- 29/028 • • by measuring mechanical or acoustic impedance [2006.01]
- 29/032 • • by measuring attenuation of acoustic waves [2006.01]
- 29/036 • • by measuring frequency or resonance of acoustic waves [2006.01]
- 29/04 • Analysing solids (using acoustic emission techniques G01N 29/14) [4, 5, 2006.01]
- 29/06 • • Visualisation of the interior, e.g. acoustic microscopy [4, 2006.01]
- 29/07 • • by measuring propagation velocity or propagation time of acoustic waves [2006.01]
- 29/09 • • by measuring mechanical or acoustic impedance [2006.01]
- 29/11 • • by measuring attenuation of acoustic waves [2006.01]
- 29/12 • • by measuring frequency or resonance of acoustic waves [5, 2006.01]
- 29/14 • using acoustic emission techniques [5, 2006.01]
- 29/22 • Details [5]
- 29/24 • • Probes [5]
- 29/26 • • Arrangements for orientation or scanning [5]
- 29/265 • • • by moving the sensor relative to a stationary material [2006.01]
- 29/27 • • • by moving the material relative to a stationary sensor [2006.01]

- 29/275 • • • by moving both the sensor and the material [2006.01]
- 29/28 • • providing acoustic coupling [5]
- 29/30 • • Arrangements for calibrating or comparing, e.g. with standard objects [2006.01]
- 29/32 • • Arrangements for suppressing undesired influences, e.g. temperature or pressure variations [2006.01]
- 29/34 • Generating the ultrasonic, sonic or infrasonic waves [2006.01]
- 29/36 • Detecting the response signal [2006.01]
- 29/38 • • by time filtering, e.g. using time gates [2006.01]
- 29/40 • • by amplitude filtering, e.g. by applying a threshold [2006.01]
- 29/42 • • by frequency filtering [2006.01]
- 29/44 • Processing the detected response signal [2006.01]
- 29/46 • • by spectral analysis, e.g. Fourier analysis [2006.01]
- 29/48 • • by amplitude comparison [2006.01]
- 29/50 • • using auto-correlation techniques or cross-correlation techniques [2006.01]
- 29/52 • • using inversion methods other than spectral analysis, e.g. conjugated gradient inversion [2006.01]

**30/00 Investigating or analysing materials by separation into components using adsorption, absorption or similar phenomena or using ion-exchange, e.g. chromatography** (G01N 3/00-G01N 29/00 take precedence) [4]

- 30/02 • Column chromatography [4]

#### **Note(s)**

In this group, the following term is used with the meaning indicated:

- "conditioning" means the adjustment or control of environmental parameters, e.g. temperature or pressure.

- 30/04 • • Preparation or injection of sample to be analysed [4]
- 30/06 • • • Preparation [4]
- 30/08 • • • • using an enricher [4]
- 30/10 • • • • using a splitter [4]
- 30/12 • • • • by evaporation [4]
- 30/14 • • • • by elimination of some components [4]
- 30/16 • • • • Injection (G01N 30/24 takes precedence) [4]
- 30/18 • • • • using a septum or microsyringe [4]
- 30/20 • • • • using a sampling valve [4]
- 30/22 • • • • in high pressure liquid systems [4]
- 30/24 • • • • Automatic injection systems [4]
- 30/26 • • Conditioning of the fluid carrier; Flow patterns [4]
- 30/28 • • • Control of physical parameters of the fluid carrier [4]
- 30/30 • • • • of temperature [4]
- 30/32 • • • • of pressure or speed (G01N 30/36 takes precedence) [4]
- 30/34 • • • • of fluid composition, e.g. gradient (G01N 30/36 takes precedence) [4]
- 30/36 • • • • in high pressure liquid systems [4]
- 30/38 • • • Flow patterns [4]
- 30/40 • • • • using back flushing [4]
- 30/42 • • • • using counter-current [4]
- 30/44 • • • • using recycling of the fraction to be distributed [4]
- 30/46 • • • • using more than one column [4]

- 30/50 • • Conditioning of the sorbent material or stationary liquid [4]
- 30/52 • • • Physical parameters [4]
- 30/54 • • • • Temperature [4]
- 30/56 • • • Packing methods or coating methods [4]
- 30/58 • • • the sorbent moving as a whole [4]
- 30/60 • • Construction of the column [4]
- 30/62 • • Detectors specially adapted therefor [4]
- 30/64 • • • Electrical detectors [4]
- 30/66 • • • • Thermal conductivity detectors [4]
- 30/68 • • • • Flame ionisation detectors [4]
- 30/70 • • • • Electron capture detectors (G01N 30/68 takes precedence) [4]
- 30/72 • • • Mass spectrometers [4]
- 30/74 • • • Optical detectors [4]
- 30/76 • • • Acoustical detectors [4]
- 30/78 • • • using more than one detector [4]
- 30/80 • • Fraction collectors [4]
- 30/82 • • • Automatic means therefor [4]
- 30/84 • • Preparation of the fraction to be distributed [4]
- 30/86 • • Signal analysis [4]
- 30/88 • • Integrated analysis systems specially adapted therefor, not covered by a single one of groups G01N 30/04-G01N 30/86 [4]
- 30/89 • Inverse chromatography, i.e. with the analyte in stationary phase [2006.01]
- 30/90 • Plate chromatography, e.g. thin layer or paper chromatography [4]
- 30/91 • • Application of the sample [4]
- 30/92 • • Construction of the plate [4]
- 30/93 • • • Application of the sorbent layer [4]
- 30/94 • • Development [4]
- 30/95 • • Detectors specially adapted therefor; Signal analysis [4]
- 30/96 • using ion-exchange (G01N 30/02, G01N 30/90 take precedence) [4]

**31/00 Investigating or analysing non-biological materials by the use of the chemical methods specified in the subgroups; Apparatus specially adapted for such methods** [4]

#### **Note(s)**

The observation of the progress of the reactions covered by groups G01N 31/02-G01N 31/22 by any of the methods specified in groups G01N 3/00-G01N 29/00, if this observation is of major importance, is classified in the relevant group covering the method.

- 31/02 • using precipitation
- 31/10 • using catalysis
- 31/12 • using combustion (G01N 25/20 takes precedence)
- 31/16 • using titration
- 31/18 • • Burettes specially adapted for titration
- 31/20 • using micro-analysis, e.g. drop reaction
- 31/22 • using chemical indicators (G01N 31/02 takes precedence)

**33/00 Investigating or analysing materials by specific methods not covered by groups G01N 1/00-G01N 31/00**

- 33/02 • Food
- 33/03 • • Edible oils or edible fats [4]
- 33/04 • • Dairy products
- 33/06 • • • Determining fat content, e.g. by butyrometer
- 33/08 • • Eggs, e.g. by candling
- 33/10 • • Starch-containing substances, e.g. dough

33/12	• • Meat; fish	33/536	• • • • with immune complex formed in liquid phase [4]
33/14	• • Beverages	33/537	• • • • • with separation of immune complex from unbound antigen or antibody [4]
33/15	• Medicinal preparations [3]	33/538	• • • • • • by sorbent column, particles or resin strip [4]
33/18	• Water	33/539	• • • • • • involving precipitating reagent [4]
33/20	• Metals	33/541	• • • • • • • Double or second antibody [4]
33/22	• Fuels; explosives	33/542	• • • • • • with steric inhibition or signal modification, e.g. fluorescent quenching [4]
33/24	• Earth materials (G01N 33/42 takes precedence)	33/543	• • • • • with an insoluble carrier for immobilising immunochemicals [4]
33/26	• Oils; viscous liquids; paints; inks (G01N 33/22 takes precedence)	33/544	• • • • • the carrier being organic [4]
33/28	• • Oils (edible oils or edible fats G01N 33/03) [4]	33/545	• • • • • • Synthetic resin [4]
33/30	• • • for lubricating properties	33/546	• • • • • • • as water suspendable particles [4]
33/32	• • Paints; inks	33/547	• • • • • • • with antigen or antibody attached to the carrier via a bridging agent [4]
33/34	• Paper	33/548	• • • • • • • Carbohydrates, e.g. dextran [4]
33/36	• Textiles	33/549	• • • • • • with antigen or antibody entrapped within the carrier [4]
33/38	• Concrete; lime; mortar; gypsum; bricks; ceramics; glass	33/551	• • • • • the carrier being inorganic [4]
33/40	• Grinding-materials	33/552	• • • • • • Glass or silica [4]
33/42	• Road-making materials (G01N 33/38 takes precedence)	33/553	• • • • • • Metal or metal coated [4]
33/44	• Resins; plastics; rubber; leather	33/554	• • • • • the carrier being a biological cell or cell fragment, e.g. bacteria, yeast cells [4]
33/46	• Wood	33/555	• • • • • • • Red blood cell [4]
33/48	• Biological material, e.g. blood, urine (G01N 33/02, G01N 33/26, G01N 33/44, G01N 33/46 take precedence); Haemocytometers (counting blood corpuscles distributed over a surface by scanning the surface G06M 11/02) [3, 4]	33/556	• • • • • • • Fixed or stabilised red blood cell [4]
33/483	• • Physical analysis of biological material [4]	33/557	• • • • • using kinetic measurement, i.e. time rate of progress of an antigen-antibody interaction [4]
33/487	• • • of liquid biological material [4]	33/558	• • • • • using diffusion or migration of antigen or antibody [4]
33/49	• • • • blood [4]	33/559	• • • • • through a gel, e.g. Ouchterlony technique [4]
33/493	• • • • • urine [4]	33/561	• • • • • • Immunoelectrophoresis [4]
33/497	• • • of gaseous biological material, e.g. breath [4]	33/563	• • • • • involving antibody fragments [4]
33/50	• • Chemical analysis of biological material, e.g. blood, urine; Testing involving biospecific ligand binding methods; Immunological testing (measuring or testing processes other than immunological involving enzymes or micro-organisms, compositions or test papers therefor; processes of forming such compositions, condition responsive control in microbiological or enzymological processes C12Q) [3]	33/564	• • • • • for pre-existing immune complex or autoimmune disease [4]
<b>Note(s)</b>		33/566	• • • • • using specific carrier or receptor proteins as ligand binding reagent [4]
In this group, the following expression is used with the meaning indicated:		33/567	• • • • • • utilising isolate of tissue or organ as binding agent [4]
• "involving", when used in relation to a material, includes the testing for the material as well as employing the material as a determinant or reactant in a test for a different material.		33/569	• • • • • for micro-organisms, e.g. protozoa, bacteria, viruses [4]
<b>Note(s)</b>		33/571	• • • • • • for venereal disease, e.g. syphilis, gonorrhoea, herpes [4]
In groups G01N 33/52-G01N 33/98, in the absence of an indication to the contrary, classification is made in the last appropriate place.		33/573	• • • • • for enzymes or isoenzymes [4]
33/52	• • • Use of compounds or compositions for colorimetric, spectrophotometric or fluorometric investigation, e.g. use of reagent paper [3]	33/574	• • • • • for cancer [4]
33/53	• • • Immunoassay; Biospecific binding assay; Materials therefor [4]	33/576	• • • • • for hepatitis [4]
33/531	• • • • Production of immunochemical test materials [4]	33/577	• • • • • involving monoclonal antibodies [4]
33/532	• • • • • Production of labelled immunochemicals [4]	33/579	• • • • • involving limulus lysate [4]
33/533	• • • • • • with fluorescent label [4]	33/58	• • • • • involving labelled substances (G01N 33/53 takes precedence) [3]
33/534	• • • • • • with radioactive label [4]	33/60	• • • • • involving radioactive labelled substances [3]
33/535	• • • • • • with enzyme label [4]	33/62	• • • • • involving urea [3]
		33/64	• • • • • involving ketones [3]
		33/66	• • • • • involving blood sugars, e.g. galactose [3]
		33/68	• • • • • involving proteins, peptides or amino acids [3]
		33/70	• • • • • involving creatine or creatinine [3]
		33/72	• • • • • involving blood pigments, e.g. hemoglobin, bilirubin [3]
		33/74	• • • • • involving hormones [3]
		33/76	• • • • • Human chorionic gonadotropin [3]
		33/78	• • • • • Thyroid gland hormones [3]

## G01N

- 33/80 • • • involving blood groups or blood types [3]
- 33/82 • • • involving vitamins [3]
- 33/84 • • • involving inorganic compounds or pH [3]
- 33/86 • • • involving blood coagulating time [3]
- 33/88 • • • involving prostaglandins [3]
- 33/90 • • • involving iron binding capacity of blood [3]
- 33/92 • • • involving lipids, e.g. cholesterol [3]
- 33/94 • • • involving narcotics [3]
- 33/96 • • • involving blood or serum control standard [3]
- 33/98 • • • involving alcohol, e.g. ethanol in breath [4]

**35/00 Automatic analysis not limited to methods or materials provided for in any single one of groups G01N 1/00-G01N 33/00; Handling materials therefor [3]**

- 35/02 • using a plurality of sample containers moved by a conveyor system past one or more treatment or analysis stations [3]
- 35/04 • • Details of the conveyor system [3]
- 35/08 • using a stream of discrete samples flowing along a tube system, e.g. flow injection analysis [3]
- 35/10 • Devices for transferring samples to, in, or from, the analysis apparatus, e.g. suction devices, injection devices [6]

**37/00 Details not covered by any other group of this subclass [3]**

**G01P MEASURING LINEAR OR ANGULAR SPEED, ACCELERATION, DECELERATION OR SHOCK; INDICATING PRESENCE OR ABSENCE OF MOVEMENT; INDICATING DIRECTION OF MOVEMENT** (measuring angular rate using gyroscopic effects G01C 19/00; combined measuring devices for measuring two or more variables of movement G01C 23/00; measuring velocity of sound G01H 5/00; measuring velocity of light G01J 7/00; determining direction or velocity of solid objects by reflection or reradiation of radio or other waves and based on propagation effects, e.g. Doppler effect, propagation time or direction of propagation, G01S; measuring speed of nuclear radiation G01T)

### Note(s)

1. This subclass covers measuring direction or velocity of flowing fluids using propagation effects of radiowaves or other waves caused in the fluid itself, e.g. by laser anemometer, by ultrasonic flowmeter with "sing-around-system".
2. Attention is drawn to the Notes following the title of class G01.

### Subclass index

INDICATING MOVEMENT OR DIRECTION OF MOVEMENT.....	13/00
MEASURING LINEAR OR ANGULAR SPEED OF SOLID BODIES	
Characterised by prevailing principle of action of the means.....	3/00
By integration; by gyroscopic effect; by averaging.....	7/00, 11/00
MEASURING SPEED OF FLUIDS OR RELATIVE SPEED OF SOLID TO FLUID OR FLUID TO SOLID.....	5/00
MEASURING ACCELERATION OR SUDDEN CHANGE OF ACCELERATION.....	15/00
DETAILS.....	1/00
FUNCTIONAL TESTING OR CALIBRATING.....	21/00

### 1/00 Details of instruments

- 1/02 • Housings
- 1/04 • Special adaptations of driving means
- 1/07 • Indicating devices, e.g. for remote indication [3]
- 1/08 • • Arrangements of scales, pointers, lamps, or acoustic indicators, e.g. in automobile speedometers
- 1/10 • • • for indicating predetermined speeds
- 1/11 • • • by the detection of the position of the indicator needle [3]
- 1/12 • Recording devices [3]
- 1/14 • • for permanent recording [3]
- 1/16 • • for erasable recording, e.g. magnetic recording [3]

**3/00 Measuring linear or angular speed; Measuring differences of linear or angular speeds** (G01P 5/00-G01P 11/00 take precedence; measuring angular rate using gyroscopic effects G01C 19/00)

### Note(s)

Groups G01P 3/02-G01P 3/64 are distinguished by the method of measurement which is of major importance. Thus the mere application of other methods for giving a final indication does not affect the classification.

- 3/02 • Devices characterised by the use of mechanical means
- 3/04 • • by comparing two speeds
- 3/06 • • • using a friction gear
- 3/08 • • • using differential gearing
- 3/10 • • by actuating an indicating element, e.g. pointer, for a fixed time
- 3/12 • • by making use of a system excited by impact
- 3/14 • • by exciting one or more mechanical resonance systems
- 3/16 • • by using centrifugal forces of solid masses
- 3/18 • • • transferred to the indicator by mechanical means
- 3/20 • • • transferred to the indicator by fluid means
- 3/22 • • • transferred to the indicator by electric or magnetic means
- 3/24 • • by using friction effects (G01P 3/06 takes precedence)

- 3/26 • Devices characterised by the use of fluids
- 3/28 • • by using pumps
- 3/30 • • by using centrifugal forces of fluids
- 3/32 • • • in a rotary container communicating with a fixed container
- 3/34 • • by using friction effects
- 3/36 • Devices characterised by the use of optical means, e.g. using infra-red, visible, or ultra-violet light (G01P 3/68 takes precedence)
- 3/38 • • using photographic means
- 3/40 • • using stroboscopic means
- 3/42 • Devices characterised by the use of electric or magnetic means (G01P 3/66 takes precedence)
- 3/44 • • for measuring angular speed (G01P 3/56 takes precedence)
- 3/46 • • • by measuring amplitude of generated current or voltage
- 3/48 • • • by measuring frequency of generated current or voltage
- 3/481 • • • • of pulse signals [3]
- 3/482 • • • • delivered by nuclear radiation detectors [3]
- 3/483 • • • • delivered by variable capacitance detectors [3]
- 3/484 • • • • delivered by contact-making switches [3]
- 3/486 • • • • delivered by photo-electric detectors [3]
- 3/487 • • • • delivered by rotating magnets [3]
- 3/488 • • • • delivered by variable reluctance detectors [3]
- 3/489 • • • • Digital circuits therefor [3]
- 3/49 • • • using eddy currents
- 3/495 • • • where the indicating means responds to forces produced by the eddy currents and the generating magnetic field [3]
- 3/50 • • for measuring linear speed (G01P 3/56 takes precedence)
- 3/52 • • • by measuring amplitude of generated current or voltage
- 3/54 • • • by measuring frequency of generated current or voltage
- 3/56 • • for comparing two speeds
- 3/58 • • • by measuring or comparing amplitudes of generated currents or voltages
- 3/60 • • • by measuring or comparing frequency of generated currents or voltages
- 3/62 • Devices characterised by the determination of the variation of atmospheric pressure with height to measure the vertical components of speed
- 3/64 • Devices characterised by the determination of the time taken to traverse a fixed distance
- 3/66 • • using electric or magnetic means (G01P 3/80 takes precedence) [4]
- 3/68 • • using optical means, i.e. using infra-red, visible, or ultra-violet light (G01P 3/80 takes precedence) [4]
- 3/80 • • using auto-correlation or cross-correlation detection means [4]
- 5/00 Measuring speed of fluids, e.g. of air stream; Measuring speed of bodies relative to fluids, e.g. of ship, of aircraft** (application of speed-measuring devices for measuring volume of fluids G01F)
- 5/01 • by using swirlflowmeter [3]
- 5/02 • by measuring forces exerted by the fluid on solid bodies, e.g. anemometer
- 5/04 • • using deflection of baffle-plates
- 5/06 • • using rotation of vanes
- 5/07 • • • with electrical coupling to the indicating device [3]
- 5/08 • by measuring variation of an electric variable directly affected by the flow, e.g. by using dynamo-electric effect
- 5/10 • by measuring thermal variables
- 5/12 • • using variation of resistance of a heated conductor
- 5/14 • by measuring differences of pressure in the fluid
- 5/16 • • using Pitot tubes
- 5/165 • • • Arrangements or constructions of Pitot tubes [3]
- 5/17 • • • Coupling arrangements to the indicating device [3]
- 5/175 • • • with the determination of Mach number [3]
- 5/18 • by measuring the time taken by the fluid to traverse a fixed distance [1, 7]
- 5/20 • • using particles entrained by a fluid stream (G01P 5/22 takes precedence) [4]
- 5/22 • • using auto-correlation or cross-correlation detection means [4]
- 5/24 • by measuring the direct influence of the streaming fluid on the properties of a detecting acoustical wave [7]
- 5/26 • by measuring the direct influence of the streaming fluid on the properties of a detecting optical wave [7]
- 7/00 Measuring speed by integrating acceleration** (inertial navigation, i.e. calculating position or speed aboard the object being navigated, by integration of speed or acceleration G01C 21/16)
- 11/00 Measuring average value of speed** (by determining time taken to traverse a fixed distance G01P 3/64, G01P 5/18)
- 11/02 • Measuring average speed of a number of bodies, e.g. of vehicles for traffic control
- 13/00 Indicating or recording presence or absence of movement; Indicating or recording of direction of movement**
- 13/02 • Indicating direction only, e.g. by weather vane
- 13/04 • • Indicating positive or negative direction of a linear movement or clockwise or anti-clockwise direction of a rotational movement [3]
- 15/00 Measuring acceleration; Measuring deceleration; Measuring shock, i.e. sudden change of acceleration**
- 15/02 • by making use of inertia forces (G01P 15/14 takes precedence) [1, 7, 2013.01]
- 15/03 • • by using non-electrical means [3]
- 15/04 • • for indicating maximum value
- 15/06 • • • using members subjected to a permanent deformation
- 15/08 • • with conversion into electric or magnetic values
- 15/09 • • • by piezo-electric pick-up [3]
- 15/093 • • • by photoelectric pick-up [7]
- 15/097 • • • by vibratory elements [7]
- 15/10 • • • • by vibratory strings
- 15/105 • • • by magnetically sensitive devices [7]
- 15/11 • • • • by inductive pick-up [3]
- 15/12 • • • by alteration of electrical resistance
- 15/125 • • • by capacitive pick-up [3]
- 15/13 • • • by measuring the force required to restore a proofmass subjected to inertial forces to a null position [3]
- 15/135 • • • by making use of contacts which are actuated by a movable inertial mass [3]

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- 15/14 • by making use of gyroscopes [1, 7, 2013.01]
- 15/16 • by evaluating the time-derivative of a measured speed signal [3, 7, 2013.01]
- 15/18 • in two or more dimensions [7, 2013.01]

- 21/00 **Testing or calibrating of apparatus or devices covered by the other groups of this subclass**
- 21/02 • of speedometers

## G01Q SCANNING-PROBE TECHNIQUES OR APPARATUS; APPLICATIONS OF SCANNING-PROBE TECHNIQUES, e.g. SCANNING-PROBE MICROSCOPY [SPM] [2010.01]

### Note(s) [2010.01]

In this subclass, the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place.

#### **10/00 Scanning or positioning arrangements, i.e. arrangements for actively controlling the movement or position of the probe [2010.01]**

- 10/02 • Coarse scanning or positioning [2010.01]
- 10/04 • Fine scanning or positioning [2010.01]
- 10/06 • • Circuits or algorithms therefor [2010.01]

#### **20/00 Monitoring the movement or position of the probe [2010.01]**

- 20/02 • by optical means [2010.01]
- 20/04 • Self-detecting probes, i.e. wherein the probe itself generates a signal representative of its position, e.g. piezo-electric gauge [2010.01]

#### **30/00 Auxiliary means serving to assist or improve the scanning probe techniques or apparatus, e.g. display or data processing devices [2010.01]**

- 30/02 • Non-SPM analysing devices, e.g. SEM [Scanning Electron Microscope], spectrometer or optical microscope [2010.01]
- 30/04 • Display or data processing devices [2010.01]
- 30/06 • • for error compensation [2010.01]
- 30/08 • Means for establishing or regulating a desired environmental condition within a sample chamber [2010.01]
- 30/10 • • Thermal environment [2010.01]
- 30/12 • • Fluid environment [2010.01]
- 30/14 • • • Liquid environment [2010.01]
- 30/16 • • Vacuum environment [2010.01]
- 30/18 • Means for protecting or isolating the interior of a sample chamber from external environmental conditions or influences, e.g. vibrations or electromagnetic fields [2010.01]
- 30/20 • Sample handling devices or methods [2010.01]

#### **40/00 Calibration, e.g. of probes [2010.01]**

- 40/02 • Calibration standards or methods of fabrication thereof [2010.01]

#### **60/00 Particular types of SPM [Scanning-Probe Microscopy] or apparatus therefor; Essential components thereof [2010.01]**

- 60/02 • Multiple-type SPM, i.e. involving two or more SPM techniques [2010.01]
- 60/04 • • STM [Scanning Tunnelling Microscopy] combined with AFM [Atomic Force Microscopy] [2010.01]
- 60/06 • • SNOM [Scanning Near-field Optical Microscopy] combined with AFM [Atomic Force Microscopy] [2010.01]
- 60/08 • • MFM [Magnetic Force Microscopy] combined with AFM [Atomic Force Microscopy] [2010.01]
- 60/10 • STM [Scanning Tunnelling Microscopy] or apparatus therefor, e.g. STM probes [2010.01]

- 60/12 • • STS [Scanning Tunnelling Spectroscopy] [2010.01]
- 60/14 • • STP [Scanning Tunnelling Potentiometry] [2010.01]
- 60/16 • • Probes, their manufacture or their related instrumentation, e.g. holders [2010.01]
- 60/18 • SNOM [Scanning Near-Field Optical Microscopy] or apparatus therefor, e.g. SNOM probes [2010.01]
- 60/20 • • Fluorescence [2010.01]
- 60/22 • • Probes, their manufacture or their related instrumentation, e.g. holders [2010.01]
- 60/24 • AFM [Atomic Force Microscopy] or apparatus therefor, e.g. AFM probes [2010.01]
- 60/26 • • Friction force microscopy [2010.01]
- 60/28 • • Adhesion force microscopy [2010.01]
- 60/30 • • Scanning potential microscopy [2010.01]
- 60/32 • • AC mode [2010.01]
- 60/34 • • • Tapping mode [2010.01]
- 60/36 • • DC mode [2010.01]
- 60/38 • • Probes, their manufacture or their related instrumentation, e.g. holders [2010.01]
- 60/40 • • • Conductive probes [2010.01]
- 60/42 • • • Functionalisation [2010.01]
- 60/44 • SICM [Scanning Ion-Conductance Microscopy] or apparatus therefor, e.g. SICM probes [2010.01]
- 60/46 • SCM [Scanning Capacitance Microscopy] or apparatus therefor, e.g. SCM probes [2010.01]
- 60/48 • • Probes, their manufacture or their related instrumentation, e.g. holders [2010.01]
- 60/50 • MFM [Magnetic Force Microscopy] or apparatus therefor, e.g. MFM probes [2010.01]
- 60/52 • • Resonance [2010.01]
- 60/54 • • Probes, their manufacture or their related instrumentation, e.g. holders [2010.01]
- 60/56 • • • Probes with magnetic coating [2010.01]
- 60/58 • SThM [Scanning Thermal Microscopy] or apparatus therefor, e.g. SThM probes [2010.01]
- 60/60 • SECM [Scanning Electro-Chemical Microscopy] or apparatus therefor, e.g. SECM probes [2010.01]

#### **70/00 General aspects of SPM probes, their manufacture or their related instrumentation, insofar as they are not specially adapted to a single SPM technique covered by group G01Q 60/00 [2010.01]**

- 70/02 • Probe holders [2010.01]
- 70/04 • • with compensation for temperature or vibration induced errors [2010.01]
- 70/06 • Probe tip arrays [2010.01]
- 70/08 • Probe characteristics [2010.01]
- 70/10 • • Shape or taper [2010.01]
- 70/12 • • • Nano-tube tips [2010.01]
- 70/14 • • Particular materials [2010.01]

- 70/16 • Probe manufacture [2010.01]  
 70/18 • • Functionalisation [2010.01]

**80/00 Applications, other than SPM, of scanning-probe techniques** (manufacture or treatment of micro-structures B81C; manufacture or treatment of nano-structures B82B 3/00; recording or reproducing information using near-field interaction G11B 9/12, G11B 11/24 or G11B 13/08) [2010.01]

**90/00 Scanning-probe techniques or apparatus not otherwise provided for** [2010.01]

**G01R MEASURING ELECTRIC VARIABLES; MEASURING MAGNETIC VARIABLES** (indicating correct tuning of resonant circuits H03J 3/12)

#### Note(s)

- This subclass covers:
  - measuring all kinds of electric or magnetic variables directly or by derivation from other electric or magnetic variables;
  - measuring all kinds of electric or magnetic properties of materials;
  - testing electric or magnetic devices, apparatus or networks (e.g. discharge tubes, amplifiers) or measuring their characteristics;
  - indicating presence or sign of current or voltage;
  - NMR, EPR or other spin-effect apparatus, not specially adapted for a particular application;
  - equipment for generating signals to be used for carrying out such tests and measurements.
- In this subclass, the following terms or expressions are used with the meanings indicated:
  - "measuring" includes investigating;
  - "instruments" or "measuring instruments" means electro-mechanical measuring mechanisms;
  - "arrangements for measuring" means apparatus, circuits, or methods for measuring;
- Attention is drawn to the Notes following the title of class G01.
- In this subclass, instruments or arrangements for measuring electric variables are classified in the following way:
  - Electromechanical instruments where the measured electric variables directly effect the indication of the measured value, including combined effects of two or more values, are classified in groups G01R 5/00-G01R 11/00.
  - Details common to different types of the instruments covered by groups G01R 5/00-G01R 11/00 are classified in group G01R 1/00.
  - Arrangements involving circuitry to obtain an indication of a measured value by deriving, calculating or otherwise processing electric variables, e.g. by comparison with another value, are classified in groups G01R 17/00-G01R 29/00.
  - Details common to different types of arrangements covered by groups G01R 17/00-G01R 29/00 are classified in group G01R 15/00.
- In this subclass, group G01R 17/00 takes precedence over groups G01R 19/00-G01R 31/00.

#### Subclass index

##### ELECTRIC MEASURING INSTRUMENTS

In general.....5/00, 7/00, 9/00  
 Details.....1/00  
 Manufacture; calibrating, testing.....3/00, 35/00

##### ELECTROMECHANICAL MEASUREMENT OF TIME INTEGRAL OF POWER OR CURRENT.....11/00

##### MEASURING ELECTRIC VARIABLES

Details of measuring arrangements.....11/02, 15/00  
 Arrangements for displaying.....13/00  
 Involving comparison with a reference value.....17/00  
 Current or voltage; power, power factor; time integral of power or current; frequency; resistance, reactance, impedance.....19/00, 21/00, 22/00, 23/00, 27/00  
 Other variables.....25/00, 29/00

##### TESTING ELECTRIC PROPERTIES OR LOCATING FAULTS.....31/00

##### MEASURING MAGNETIC VARIABLES.....33/00

**1/00 Details of instruments or arrangements of the types covered by groups G01R 5/00-G01R 13/00 or G01R 31/00** (constructional details particular to electromechanical arrangements for measuring the electric consumption G01R 11/02) [3, 2006.01]

- 1/02 • General constructional details  
 1/04 • • Housings; Supporting members; Arrangements of terminals  
 1/06 • • Measuring leads; Measuring probes (G01R 19/145, G01R 19/165 take precedence) [3]  
 1/067 • • • Measuring probes [3]  
 1/07 • • • Non contact-making probes [6]  
 1/073 • • • • Multiple probes [3]

- 1/08 • • Pointers; Scales, Scale illumination  
 1/10 • • Arrangements of bearings  
 1/12 • • • of strip or wire bearings  
 1/14 • • Braking arrangements; Damping arrangements  
 1/16 • • Magnets  
 1/18 • • Screening arrangements against electric or magnetic fields, e.g. against earth's field  
 1/20 • Modifications of basic electric elements for use in electric measuring instruments; Structural combinations of such elements with such instruments  
 1/22 • • Tong testers acting as secondary windings of current transformers

- 1/24 • • Transmission-line, e.g. waveguide, measuring sections, e.g. slotted section
- 1/26 • • • with linear movement of probe
- 1/28 • Provision in measuring instruments for reference values, e.g. standard voltage, standard waveform
- 1/30 • Structural combination of electric measuring instruments with basic electronic circuits, e.g. with amplifier
- 1/36 • Overload-protection arrangements or circuits for electric measuring instruments
- 1/38 • Arrangements for altering the indicating characteristic, e.g. by modifying the air gap
- 1/40 • Modifications of instruments to indicate the maximum or the minimum value reached in a time interval, e.g. by maximum indicator pointer [3]
- 1/42 • • thermally operated
- 1/44 • Modifications of instruments for temperature compensation [2]

### 3/00 Apparatus or processes specially adapted for the manufacture of measuring instruments

### 5/00 Instruments for converting a single current or a single voltage into a mechanical displacement

- 5/02 • Moving-coil instruments
- 5/04 • • with magnet external to the coil
- 5/06 • • with core magnet
- 5/08 • • specially adapted for wide angle deflection; with eccentrically-pivoted moving coil
- 5/10 • String galvanometers
- 5/12 • Loop galvanometers
- 5/14 • Moving-iron instruments
- 5/16 • • with pivoting magnet
- 5/18 • • with pivoting soft iron, e.g. needle galvanometer
- 5/20 • Induction instruments e.g. Ferraris instruments
- 5/22 • Thermoelectric instruments
- 5/24 • • operated by elongation of a strip or wire or by expansion of a gas or fluid
- 5/26 • • operated by deformation of a bimetallic element
- 5/28 • Electrostatic instruments
- 5/30 • • Leaf electrometers
- 5/32 • • Wire electrometers; Needle electrometers
- 5/34 • • Quadrant electrometers

### 7/00 Instruments capable of converting two or more currents or voltages into a single mechanical displacement (G01R 9/00 takes precedence)

- 7/02 • for forming a sum or a difference
- 7/04 • for forming a quotient (for measuring resistance G01R 27/08)
- 7/06 • • moving-iron type
- 7/08 • • moving-coil type, e.g. crossed-coil type
- 7/10 • • • having more than two moving coils
- 7/12 • for forming product
- 7/14 • • moving-iron type
- 7/16 • • having both fixed and moving coils, i.e. dynamometers
- 7/18 • • • with iron core magnetically coupling fixed and moving coils

### 9/00 Instruments employing mechanical resonance

- 9/02 • Vibration galvanometers, e.g. for measuring current
- 9/04 • using vibrating reeds, e.g. for measuring frequency
- 9/06 • • magnetically driven
- 9/08 • • piezo-electrically driven

### 11/00 Electromechanical arrangements for measuring time integral of electric power or current, e.g. of consumption (monitoring electric consumption of electrically-propelled vehicles B60L 3/00)

- 11/02 • Constructional details
- 11/04 • • Housings; Supporting racks; Arrangements of terminals
- 11/06 • • Magnetic circuits of induction meters [2]
- 11/067 • • • Coils therefor [2]
- 11/073 • • • Armatures therefor [2]
- 11/09 • • • • Disc armatures [2]
- 11/10 • • Braking magnets; Damping arrangements
- 11/12 • • Arrangements of bearings
- 11/14 • • • with magnetic relief
- 11/16 • • Adaptations of counters to electricity meters
- 11/17 • • Compensating for errors; Adjusting or regulating means therefor [2]
- 11/18 • • • Compensating for variations in ambient conditions [2]
- 11/185 • • • • Temperature compensation [2]
- 11/19 • • • Compensating for errors caused by disturbing torque, e.g. rotating-field errors of polyphase meters [2]
- 11/20 • • • Compensating for phase errors in induction meters [2]
- 11/21 • • • Compensating for errors caused by damping effects of the current, e.g. adjustment in the overload range [2]
- 11/22 • • • Adjusting torque, e.g. adjusting starting torque, adjusting of polyphase meters for obtaining equal torques [2]
- 11/23 • • • Compensating for errors caused by friction, e.g. adjustment in the light-load range [2]
- 11/24 • • Arrangements for avoiding or indicating fraudulent use [4]
- 11/25 • • Arrangements for indicating or signalling faults [2, 4]

#### Note(s)

Groups G01R 11/48-G01R 11/56 take precedence over groups G01R 11/30-G01R 11/46.

- 11/30 • Dynamo-electric motor meters
- 11/32 • • Watt-hour meters
- 11/34 • • Ampère-hour meters
- 11/36 • Induction meters, e.g. Ferraris meters
- 11/38 • • for single-phase operation
- 11/40 • • for polyphase operation
- 11/42 • • • Circuitry therefor
- 11/46 • Electrically-operated clockwork meters; Oscillatory meters; Pendulum meters
- 11/48 • Meters specially adapted for measuring real or reactive components; Meters specially adapted for measuring apparent energy
- 11/50 • • for measuring real component
- 11/52 • • for measuring reactive component
- 11/54 • • for measuring simultaneously at least two of the following three variables: real component, reactive component, apparent energy
- 11/56 • Special tariff meters
- 11/57 • • Multi-rate meters (G01R 11/63 takes precedence) [2]
- 11/58 • • • Tariff-switching devices therefor [2]
- 11/60 • • Subtraction meters; Meters measuring maximum or minimum-load hours

- 11/63 • • Over-consumption meters, e.g. measuring consumption while a predetermined level of power is exceeded [2]
- 11/64 • • Maximum meters, e.g. tariff for a period is based on maximum demand within that period
- 11/66 • • • Circuitry
- 13/00 Arrangements for displaying electric variables or waveforms [4]**
- 13/02 • for displaying measured electric variables in digital form [4]
- 13/04 • for producing permanent records [4]
- 13/06 • • Modifications for recording transient disturbances, e.g. by starting or accelerating a recording medium
- 13/08 • • Electromechanical recording system using a mechanical direct-writing method
- 13/10 • • • with intermittent recording by representing the variable by the length of a stroke or by the position of a dot
- 13/12 • • Chemical recording, e.g. clydonographs (G01R 13/14 takes precedence)
- 13/14 • • Recording on a light-sensitive material
- 13/16 • • Recording on a magnetic medium
- 13/18 • • • using boundary displacement
- 13/20 • Cathode-ray oscilloscopes
- 13/22 • • Circuits therefor
- 13/24 • • • Time-base deflection circuits
- 13/26 • • • Circuits for controlling the intensity of the electron beam
- 13/28 • • • Circuits for simultaneous or sequential presentation of more than one variable
- 13/30 • • • Circuits for inserting reference markers, e.g. for timing, for calibrating, for frequency marking
- 13/32 • • • Circuits for displaying non-recurrent functions such as transients; Circuits for triggering; Circuits for synchronisation; Circuits for time-base expansion
- 13/34 • • • Circuits for representing a single waveform by sampling, e.g. for very high frequencies [2]
- 13/36 • using length of glow discharge, e.g. glowlight oscilloscopes [4]
- 13/38 • using the steady or oscillatory displacement of a light beam by an electromechanical measuring system [4]
- 13/40 • using modulation of a light beam otherwise than by mechanical displacement, e.g. by Kerr effect [4]
- 13/42 • Instruments using length of spark discharge, e.g. by measuring maximum separation of electrodes to produce spark
- 15/00 Details of measuring arrangements of the types provided for in groups G01R 17/00-G01R 29/00, G01R 33/00-G01R 33/26 or G01R 35/00 [1, 2006.01]**
- 15/04 • Voltage dividers [6]
- 15/06 • • having reactive components, e.g. capacitive transformer [6]
- 15/08 • Circuits for altering the measuring range
- 15/09 • • Autoranging circuits [6]
- 15/12 • Circuits for multi-testers, e.g. for measuring voltage, current, or impedance at will
- 15/14 • Adaptations providing voltage or current isolation, e.g. for high-voltage or high-current networks [6]
- 15/16 • • using capacitive devices [6]
- 15/18 • • using inductive devices, e.g. transformers [6]
- 15/20 • • using galvano-magnetic devices, e.g. Hall-effect devices [6]
- 15/22 • • using light-emitting devices, e.g. LED, optocouplers [6]
- 15/24 • • using light-modulating devices [6]
- 15/26 • • using modulation of waves other than light, e.g. radio or acoustic waves [6]
- 17/00 Measuring arrangements involving comparison with a reference value, e.g. bridge**
- 17/02 • Arrangements in which the value to be measured is automatically compared with a reference value
- 17/04 • • in which the reference value is continuously or periodically swept over the range of values to be measured
- 17/06 • • Automatic balancing arrangements
- 17/08 • • • in which a force or torque representing the measured value is balanced by a force or torque representing the reference value
- 17/10 • ac or dc measuring bridges
- 17/12 • • using comparison of currents, e.g. bridges with differential current output
- 17/14 • • with indication of measured value by calibrated null indicator, e.g. percent bridge, tolerance bridge (G01R 17/12, G01R 17/16 take precedence)
- 17/16 • • with discharge tubes or semiconductor devices in one or more arms of the bridge, e.g. voltmeter using a difference amplifier
- 17/18 • • with more than four branches
- 17/20 • ac or dc potentiometric measuring arrangements
- 17/22 • • with indication of measured value by calibrated null indicator
- 19/00 Arrangements for measuring currents or voltages or for indicating presence or sign thereof (G01R 5/00 takes precedence; for measuring bioelectric currents or voltages A61B 5/04) [4]**
- Note(s)**
- Within groups G01R 19/02-G01R 19/32, group G01R 19/28 takes precedence. Groups G01R 19/18-G01R 19/25 take precedence over groups G01R 19/02-G01R 19/165 and G01R 19/30.
- 19/02 • Measuring effective values, i.e. root-mean-square values
- 19/03 • • using thermoconverters [4]
- 19/04 • Measuring peak values of ac or of pulses [2]
- 19/06 • Measuring real component; Measuring reactive component
- 19/08 • Measuring current density
- 19/10 • Measuring sum, difference, or ratio
- 19/12 • Measuring rate of change
- 19/14 • Indicating direction of current; Indicating polarity of voltage
- 19/145 • Indicating the presence of current or voltage [3]
- 19/15 • • Indicating the presence of current [3]
- 19/155 • • Indicating the presence of voltage [3]
- 19/165 • Indicating that current or voltage is either above or below a predetermined value or within or outside a predetermined range of values [3]
- 19/17 • • giving an indication of the number of times this occurs [3]
- 19/175 • Indicating the instants of passage of current or voltage through a given value, e.g. passage through zero [3]
- 19/18 • using conversion of dc into ac, e.g. with choppers
- 19/20 • • using transducers
- 19/22 • using conversion of ac into dc
- 19/25 • using digital measurement techniques [3]

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- 19/252 • • using analogue/digital converters of the type with conversion of voltage or current into frequency and measuring of this frequency [4]
- 19/255 • • using analogue/digital converters of the type with counting of pulses during a period of time proportional to voltage or current, delivered by a pulse generator with fixed frequency [4]
- 19/257 • • using analogue/digital converters of the type with comparison of different reference values with the value of voltage or current, e.g. using step-by-step method [4]
- 19/28 • adapted for measuring in circuits having distributed constants
- 19/30 • Measuring the maximum or the minimum value of current or voltage reached in a time interval (G01R 19/04 takes precedence) [2, 3]
- 19/32 • Compensating for temperature change [2]
- 21/00 Arrangements for measuring electric power or power factor (G01R 7/12 takes precedence) [4]**
- 21/01 • in circuits having distributed constants (G01R 21/04, G01R 21/07, G01R 21/09, G01R 21/12 take precedence) [2]
- 21/02 • by thermal methods [2]
- 21/04 • • in circuits having distributed constants
- 21/06 • by measuring current and voltage (G01R 21/08-G01R 21/133 take precedence) [4]
- 21/07 • • in circuits having distributed constants (G01R 21/09 takes precedence) [2]
- 21/08 • by using galvanomagnetic-effect devices, e.g. Hall-effect devices [2]
- 21/09 • • in circuits having distributed constants [2]
- 21/10 • by using square-law characteristics of circuit elements, e.g. diodes, to measure power absorbed by loads of known impedance (G01R 21/02 takes precedence) [2]
- 21/12 • • in circuits having distributed constants
- 21/127 • by using pulse modulation (G01R 21/133 takes precedence) [4]
- 21/133 • by using digital technique [4]
- 21/14 • Compensating for temperature change [2]

### **22/00 Arrangements for measuring time integral of electric power or current, e.g. electricity meters [4, 2006.01]**

#### **Note(s)**

An arrangement for measuring time integral of electric power is classified in group G01R 21/00 if the essential characteristic is the measuring of electric power.

- 22/02 • by electrolytic methods [4]
- 22/04 • by calorimetric methods [4]
- 22/06 • by electronic methods [2006.01]
- 22/08 • • using analogue techniques [2006.01]
- 22/10 • • using digital techniques [2006.01]
- 23/00 Arrangements for measuring frequencies; Arrangements for analysing frequency spectra**
- 23/02 • Arrangements for measuring frequency, e.g. pulse repetition rate; Arrangements for measuring period of current or voltage
- 23/04 • • adapted for measuring in circuits having distributed constants
- 23/06 • • by converting frequency into an amplitude of current or voltage
- 23/07 • • • using response of circuits tuned on resonance, e.g. grid-drip meter [2]
- 23/08 • • • using response of circuits tuned off resonance

- 23/09 • • • using analogue integrators, e.g. capacitors establishing a mean value by balance of input signals and defined discharge signals or leakage [2]
- 23/10 • • by converting frequency into a train of pulses, which are then counted
- 23/12 • • by converting frequency into phase shift
- 23/14 • • by heterodyning; by beat-frequency comparison [2]
- 23/15 • • Indicating that frequency of pulses is either above or below a predetermined value or within or outside a predetermined range of values, by making use of non-linear or digital elements [3]
- 23/16 • Spectrum analysis; Fourier analysis
- 23/163 • • adapted for measuring in circuits having distributed constants [3]
- 23/165 • • using filters [3]
- 23/167 • • • with digital filters [3]
- 23/17 • • with optical auxiliary devices [3]
- 23/173 • • Wobulating devices similar to swept panoramic receivers [3]
- 23/175 • • by delay means, e.g. tapped delay lines [3]
- 23/177 • • Analysis of very low frequencies [3]
- 23/18 • • with provision for recording frequency spectrum
- 23/20 • • Measurement of non-linear distortion
- 25/00 Arrangements for measuring phase angle between a voltage and a current or between voltages or currents [2]**
- 25/02 • in circuits having distributed constants
- 25/04 • involving adjustment of a phase shifter to produce a predetermined phase difference, e.g. zero difference
- 25/06 • employing quotient instrument
- 25/08 • by counting of standard pulses [2]
- 27/00 Arrangements for measuring resistance, reactance, impedance, or electric characteristics derived therefrom**
- 27/02 • Measuring real or complex resistance, reactance, impedance, or other two-pole characteristics derived therefrom, e.g. time constant (by measuring phase angle only G01R 25/00)
- 27/04 • • in circuits having distributed constants
- 27/06 • • • Measuring reflection coefficients; Measuring standing-wave ratio
- 27/08 • • Measuring resistance by measuring both voltage and current
- 27/10 • • • using two-coil or crossed-coil instruments forming quotient
- 27/12 • • • • using hand generators, e.g. meggers
- 27/14 • • Measuring resistance by measuring current or voltage obtained from a reference source (G01R 27/16, G01R 27/20, G01R 27/22 take precedence)
- 27/16 • • Measuring impedance of element or network through which a current is passing from another source, e.g. cable, power line
- 27/18 • • • Measuring resistance to earth
- 27/20 • • Measuring earth resistance; Measuring contact resistance of earth connections, e.g. plates
- 27/22 • • Measuring resistance of fluids
- 27/26 • • Measuring inductance or capacitance; Measuring quality factor, e.g. by using the resonance method; Measuring loss factor; Measuring dielectric constants

- 27/28 • Measuring attenuation, gain, phase shift, or derived characteristics of electric four-pole networks, i.e. two-port networks; Measuring transient response (in line transmission systems H04B 3/46)
- 27/30 • • with provision for recording characteristics, e.g. by plotting Nyquist diagram
- 27/32 • • in circuits having distributed constants [2]
- 29/00 Arrangements for measuring or indicating electric quantities not covered by groups G01R 19/00-G01R 27/00**
- 29/02 • Measuring characteristics of individual pulses, e.g. deviation from pulse flatness, rise time or duration [3]
- 29/027 • • Indicating that a pulse characteristic is either above or below a predetermined value or within or beyond a predetermined range of values [3]
- 29/033 • • • giving an indication of the number of times this occurs [3]
- 29/04 • Measuring form factor, i.e. quotient of root-mean-square value and arithmetic mean of instantaneous value; Measuring peak factor, i.e. quotient of maximum value and root-mean-square value
- 29/06 • Measuring depth of modulation
- 29/08 • Measuring electromagnetic field characteristics
- 29/10 • • Radiation diagrams of aerials
- 29/12 • Measuring electrostatic fields
- 29/14 • • Measuring field distribution
- 29/16 • Measuring asymmetry of polyphase networks
- 29/18 • Indicating phase sequence; Indicating synchronism
- 29/20 • Measuring number of turns; Measuring transformation ratio or coupling factor of windings
- 29/22 • Measuring piezo-electric properties
- 29/24 • Arrangements for measuring quantities of charge [2]
- 29/26 • Measuring noise figure; Measuring signal-to-noise ratio [2]
- 31/00 Arrangements for testing electric properties; Arrangements for locating electric faults; Arrangements for electrical testing characterised by what is being tested not provided for elsewhere** (testing or measuring semiconductors or solid state devices during manufacture H01L 21/66; testing line transmission systems H04B 3/46)
- 31/01 • Subjecting similar articles in turn to test, e.g. "go/no-go" tests in mass production; Testing objects at points as they pass through a testing station (G01R 31/18 takes precedence) [6]
- 31/02 • Testing of electric apparatus, lines, or components for short-circuits, discontinuities, leakage, or incorrect line connection
- 31/04 • • Testing connections, e.g. of plugs, of non-disconnectable joints
- 31/06 • • Testing of electric windings, e.g. for polarity
- 31/07 • • Testing of fuses [6]
- 31/08 • Locating faults in cables, transmission lines, or networks
- 31/10 • • by increasing destruction at fault, e.g. burning-in by using a pulse generator operating a special programme
- 31/11 • • using pulse-reflection methods
- 31/12 • Testing dielectric strength or breakdown voltage
- 31/14 • • Circuits therefor
- 31/16 • • Construction of testing vessels; Electrodes therefor
- 31/18 • • Subjecting similar articles in turn to test, e.g. "go/no-go" tests in mass production
- 31/20 • • Preparation of articles or specimens to facilitate testing
- 31/24 • Testing of discharge tubes (during manufacture H01J 9/42) [2]
- 31/25 • • Testing of vacuum tubes [2]
- 31/26 • *Testing of individual semiconductor devices (testing or measuring during manufacture or treatment H01L 21/66; testing of photovoltaic devices H02S 50/10) [2, 2014.01]*
- 31/265 • • Contactless testing [6]
- 31/27 • • Testing of devices without physical removal from the circuit of which they form part, e.g. compensating for effects due to surrounding elements [6]
- 31/28 • Testing of electronic circuits, e.g. by signal tracer (testing computers during standby operation or idle time G06F 11/22)
- 31/30 • • Marginal testing, e.g. by varying supply voltage (testing computers during standby operation or idle time G06F 11/22) [2]
- 31/302 • • Contactless testing [5]
- 31/303 • • • of integrated circuits (G01R 31/305-G01R 31/315 take precedence) [6]
- 31/304 • • • of printed or hybrid circuits (G01R 31/305-G01R 31/315 take precedence) [6]
- 31/305 • • • using electron beams [5]
- 31/306 • • • • of printed or hybrid circuits [6]
- 31/307 • • • • of integrated circuits [6]
- 31/308 • • • using non-ionising electromagnetic radiation, e.g. optical radiation [5]
- 31/309 • • • • of printed or hybrid circuits [6]
- 31/311 • • • • of integrated circuits [6]
- 31/312 • • • by capacitive methods [5]
- 31/315 • • • by inductive methods [5]
- 31/316 • • • Testing of analog circuits [6]
- 31/3161 • • • Marginal testing [6]
- 31/3163 • • • Functional testing [6]
- 31/3167 • • • Testing of combined analog and digital circuits [6]
- 31/317 • • • Testing of digital circuits [6]
- 31/3173 • • • Marginal testing [6]
- 31/3177 • • • Testing of logic operation, e.g. by logic analysers [6]
- 31/3181 • • • Functional testing (G01R 31/3177 takes precedence) [6]
- 31/3183 • • • • Generation of test inputs, e.g. test vectors, patterns or sequences [6]
- 31/3185 • • • • Reconfiguring for testing, e.g. LSSD, partitioning [6]
- 31/3187 • • • • Built-in tests [6]
- 31/319 • • • • Tester hardware, i.e. output processing circuits [6]
- 31/3193 • • • • • with comparison between actual response and known fault-free response [6]
- 31/327 • Testing of circuit interrupters, switches or circuit-breakers [6]
- 31/333 • • Testing of the switching capacity of high-voltage circuit-breakers [6]
- 31/34 • Testing dynamo-electric machines [3]
- 31/36 • Apparatus for testing electrical condition of accumulators or electric batteries, e.g. capacity or charge condition (accumulators combined with arrangements for measuring, testing or indicating condition H01M 10/48) [3]
- 31/40 • *Testing power supplies (testing photovoltaic devices H02S 50/10) [6, 2014.01]*
- 31/42 • • AC power supplies [6]

## G01R

31/44 • Testing lamps [6]

### 33/00 Arrangements or instruments for measuring magnetic variables

33/02 • Measuring direction or magnitude of magnetic fields or magnetic flux (G01R 33/20 takes precedence) [4]

33/022 • • Measuring gradient [3]

#### Note(s)

Group G01R 33/022 or group G01R 33/10 takes precedence over groups G01R 33/025-G01R 33/06.

33/025 • • Compensating stray fields [3]

33/028 • • Electrodynamic magnetometers [3]

33/032 • • using magneto-optic devices, e.g. Faraday [3]

33/035 • • using superconductive devices [3]

33/038 • • using permanent magnets, e.g. balances, torsion devices [3]

33/04 • • using the flux-gate principle

33/05 • • • in thin-film element [3]

33/06 • • using galvano-magnetic devices

33/07 • • • Hall-effect devices [6]

33/09 • • • Magneto-resistive devices [6]

33/10 • • Plotting field distribution

33/12 • Measuring magnetic properties of articles or specimens of solids or fluids (involving magnetic resonance G01R 33/20) [4]

33/14 • • Measuring or plotting hysteresis curves

33/16 • • Measuring susceptibility

33/18 • • Measuring magnetostrictive properties

33/20 • involving magnetic resonance (medical aspects A61B 5/055; magnetic resonance gyrometers G01C 19/60) [4, 5]

33/24 • • for measuring direction or magnitude of magnetic fields or magnetic flux [4]

33/26 • • • using optical pumping [4]

33/28 • • Details of apparatus provided for in groups G01R 33/44-G01R 33/64 [5]

33/30 • • • Sample handling arrangements, e.g. sample cells, spinning mechanisms [5]

33/31 • • • • Temperature control thereof [6]

33/32 • • • Excitation or detection systems, e.g. using radiofrequency signals [5]

33/34 • • • • Constructional details, e.g. resonators [5]

33/341 • • • • • comprising surface coils [6]

33/3415 • • • • • • comprising arrays of sub-coils [6]

33/343 • • • • • of slotted-tube or loop-gap type [6]

33/345 • • • • • of waveguide type (G01R 33/343 takes precedence) [6]

33/36 • • • • Electrical details, e.g. matching or coupling of the coil to the receiver [5]

33/38 • • • Systems for generation, homogenisation or stabilisation of the main or gradient magnetic field [5]

#### Note(s)

Groups G01R 33/385-G01R 33/389 take precedence over groups G01R 33/381-G01R 33/383.

33/381 • • • • using electromagnets [6]

33/3815 • • • • • with superconducting coils, e.g. power supply therefor [6]

33/383 • • • • using permanent magnets [6]

33/385 • • • • using gradient magnetic field coils [6]

33/387 • • • • Compensation of inhomogeneities [6]

33/3873 • • • • • using ferromagnetic bodies [6]

33/3875 • • • • • using correction coil assemblies, e.g. active shimming [6]

33/389 • • • • Field stabilisation [6]

33/42 • • • Screening [5, 6]

33/421 • • • • of main or gradient magnetic field [6]

33/422 • • • • of the radiofrequency field [6]

33/44 • • using nuclear magnetic resonance (NMR) (G01R 33/24, G01R 33/62 take precedence) [5]

33/46 • • • NMR spectroscopy [5]

33/465 • • • • applied to biological material, e.g. *in vitro* testing [6]

33/48 • • • NMR imaging systems [5]

33/483 • • • • with selection of signal or spectra from particular regions of the volume, e.g. *in vivo* spectroscopy [6]

33/485 • • • • • based on chemical shift information [6]

33/50 • • • • based on the determination of relaxation times [5]

33/54 • • • • Signal processing systems, e.g. using pulse sequences [5]

33/56 • • • • • Image enhancement or correction, e.g. subtraction or averaging techniques [5]

33/561 • • • • • • by reduction of the scanning time, i.e. fast acquiring systems, e.g. using echo-planar pulse sequences [6]

33/563 • • • • • • of moving material, e.g. flow-contrast angiography [6]

33/565 • • • • • • Correction of image distortions, e.g. due to magnetic field inhomogeneities [6]

33/567 • • • • • • gated by physiological signals [6]

33/58 • • • • Calibration of imaging systems, e.g. using test probes [5]

33/60 • • using electron paramagnetic resonance (G01R 33/24, G01R 33/62 take precedence) [5]

33/62 • • using double resonance (G01R 33/24 takes precedence) [5]

33/64 • • using cyclotron resonance (G01R 33/24 takes precedence) [5]

### 35/00 Testing or calibrating of apparatus covered by the other groups of this subclass [2]

35/02 • of auxiliary devices, e.g. of instrument transformers according to prescribed transformation ratio, phase angle, or wattage rating

35/04 • of instruments for measuring time integral of power or current

35/06 • • by stroboscopic methods

**G01S RADIO DIRECTION-FINDING; RADIO NAVIGATION; DETERMINING DISTANCE OR VELOCITY BY USE OF RADIO WAVES; LOCATING OR PRESENCE-DETECTING BY USE OF THE REFLECTION OR RERADIATION OF RADIO WAVES; ANALOGOUS ARRANGEMENTS USING OTHER WAVES**

**Note(s)**

- In this subclass, the following term is used with the meaning indicated:
  - "transponder" means an arrangement which reacts to an incoming interrogating or detecting wave by emitting a specific answering or identifying wave.
- Attention is drawn to the Notes following the title of class G01 and to Note (1) following the title of subclass G09B.

**Subclass index**

BEACON SYSTEMS; DIRECTION-FINDERS; POSITION FIXING.....	1/00, 19/00, 3/00, 5/00
RADAR OR ANALOGOUS SYSTEMS	
Details.....	7/00
Using radio waves, using other waves where the wavelength or the kind of wave is irrelevant or unspecified.....	13/00
Using acoustic waves.....	15/00
Using electromagnetic waves other than radio waves.....	17/00
SYSTEMS FOR DETERMINING DISTANCE OR VELOCITY NOT USING REFLECTION OR RERADIATION.....	11/00

<b>1/00 Beacons or beacon systems transmitting signals having a characteristic or characteristics capable of being detected by non-directional receivers and defining directions, positions, or position lines fixed relatively to the beacon transmitters; Receivers co-operating therewith (position-fixing by co-ordinating a plurality of determinations of direction or position lines G01S 5/00) [2]</b>	<b>1/24</b>	<b>• • • •</b>	<b>the synchronised signals being pulses or equivalent modulations on carrier waves and the transit times being compared by measuring the difference in arrival time of a significant part of the modulations</b>
1/02 • using radio waves (G01S 19/00 takes precedence) [1, 2010.01]	1/26	• • • •	• Systems in which pulses or time-base signals are generated locally at the receiver and brought into predetermined time-relationship with received signals, e.g. pulse duration coincides with time interval between arrival of significant part of modulation of signals received from first and second aerials or aerial systems
1/04 • • Details	1/28	• • • •	• wherein the predetermined time-relationship is maintained automatically
1/06 • • • Means for providing multiple indication, e.g. coarse and fine indications	1/30	• • • •	• the synchronised signals being continuous waves or intermittent trains of continuous waves, the intermittency not being for the purpose of determining direction or position line and the transit times being compared by measuring the phase difference
1/08 • • Systems for determining direction or position line	1/32	• • • •	• Systems in which the signals received, with or without amplification, or signals derived therefrom, are compared in phase directly
1/10 • • • using amplitude comparison of signals transmitted sequentially from aerials or aerial systems having differently-oriented overlapping directivity-characteristics, e.g. equi-signal A-N type	1/34	• • • •	• Systems in which first and second synchronised signals are transmitted from both aerials or aerial systems and a beat frequency, obtained by heterodyning the first signals with each other is compared in phase with a beat frequency obtained by heterodyning the second signals with each other
1/12 • • • • the signals being transmitted sequentially from an aerial or aerial system having the orientation of its directivity characteristic periodically varied, e.g. by means of sequentially effective reflectors	1/36	• • • •	• Systems in which a beat frequency, obtained by heterodyning the synchronised signals, is compared in phase with a reference signal having a phase substantially independent of direction
1/14 • • • using amplitude comparison of signals transmitted simultaneously from aerials or aerial systems having differently-oriented overlapping directivity-characteristics			
1/16 • • • • Azimuthal guidance systems, e.g. system for defining aircraft approach path, localiser system			
1/18 • • • • Elevational guidance systems, e.g. system for defining aircraft glide path			
1/20 • • • using a comparison of transit time of synchronised signals transmitted from non-directional aerials or aerial systems spaced apart, i.e. path-difference systems			
1/22 • • • • the synchronised signals being frequency modulations on carrier waves and the transit times being compared by measuring difference of instantaneous frequencies of received carrier waves			

- 1/38 • • • using comparison of (1) the phase of the envelope of the change of frequency, due to Doppler effect, of the signal transmitted by an aerial moving, or appearing to move, in a cyclic path with (2) the phase of a reference signal, the frequency of this reference signal being synchronised with that of the cyclic movement, or apparent cyclic movement, of the aerial
- 1/40 • • • • the apparent movement of the aerial being produced by cyclic sequential energisation of fixed aerials
- 1/42 • • • Conical-scan beam beacons transmitting signals which indicate at a mobile receiver any displacement of the receiver from the conical-scan axis, e.g. for "beam-riding" missile control [5]
- 1/44 • • • Rotating or oscillating beam beacons defining directions in the plane of rotation or oscillation [5]
- 1/46 • • • • Broad-beam systems producing at a receiver a substantially continuous sinusoidal envelope signal of the carrier wave of the beam, the phase angle of which is dependent upon the angle between the direction of the receiver from the beacon and a reference direction from the beacon, e.g. cardioid system [5]
- 1/48 • • • • • wherein the phase angle of the direction-dependent envelope signal is a multiple of the direction angle, e.g. for "fine" bearing indication [5]
- 1/50 • • • • • wherein the phase angle of the direction-dependent envelope signal is compared with a non-direction- dependent reference signal [5]
- 1/52 • • • • • wherein the phase angles of a plurality of direction-dependent envelope signals produced by a plurality of beams rotating at different speeds or in different directions are compared [5]
- 1/54 • • • • Narrow-beam systems producing at a receiver a pulse-type envelope signal of the carrier wave of the beam, the timing of which is dependent upon the angle between the direction of the receiver from the beacon and a reference direction from the beacon; Overlapping broad beam systems defining a narrow zone and producing at a receiver a pulse-type envelope signal of the carrier wave of the beam, the timing of which is dependent upon the angle between the direction of the receiver from the beacon and a reference direction from the beacon [5]
- 1/56 • • • • • Timing the pulse-type envelope signals derived by reception of beam [5]
- 1/58 • • • • • wherein a characteristic of the beam transmitted or of an auxiliary signal is varied in time synchronously with rotation or oscillation of the beam [5]
- 1/60 • • • • • Varying frequency of beam signal or of auxiliary signal [5]
- 1/62 • • • • • Varying phase-relationship between beam and auxiliary signal [5]
- 1/64 • • • • • Varying pulse timing, e.g. varying interval between pulses radiated in pairs [5]
- 1/66 • • • • • Superimposing direction-indicating intelligence signals, e.g. speech, Morse [5]
- 1/68 • • Marker, boundary, call-sign, or like beacons transmitting signals not carrying directional information
- 1/70 • using electromagnetic waves other than radio waves
- 1/72 • using ultrasonic, sonic, or infrasonic waves
- 1/74 • • Details [5]
- 1/76 • • Systems for determining direction or position line [5]
- 1/78 • • • using amplitude comparison of signals transmitted from transducers or transducer systems having differently-oriented characteristics [5]
- 1/80 • • • using a comparison of transit time of synchronised signals transmitted from non-directional transducers or transducer systems spaced apart, i.e. path-difference systems [5]
- 1/82 • • • Rotating or oscillating beam beacons defining directions in the plane of rotation or oscillation [5]
- 3/00 Direction-finders for determining the direction from which infrasonic, sonic, ultrasonic, or electromagnetic waves, or particle emission, not having a directional significance, are being received (position-fixing by co-ordinating a plurality of determinations of direction or position lines G01S 5/00)**
- 3/02 • using radio waves
- 3/04 • • Details
- 3/06 • • • Means for increasing effective directivity, e.g. by combining signals having differently-oriented directivity characteristics or by sharpening the envelope waveform of the signal derived from a rotating or oscillating beam aerial (comparing amplitude of signals having differently-oriented directivity characteristics to determine direction G01S 3/16, G01S 3/28)
- 3/08 • • • Means for reducing polarisation errors, e.g. by use of Adcock or spaced loop aerial systems
- 3/10 • • • Means for reducing or compensating for quadrantal, site, or like errors
- 3/12 • • • Means for determining sense of direction, e.g. by combining signals from directional aerial or goniometer search coil with those from non-directional aerial (determining direction by amplitude comparison of signals derived by combining directional and non-directional signals G01S 3/24, G01S 3/34)
- 3/14 • • Systems for determining direction or deviation from predetermined direction
- 3/16 • • • using amplitude comparison of signals derived sequentially from receiving aerials or aerial systems having differently-oriented directivity characteristics or from an aerial system having periodically-varied orientation of directivity characteristic
- 3/18 • • • • derived directly from separate directional aerials
- 3/20 • • • • derived by sampling signal received by an aerial system having periodically-varied orientation of directivity characteristic
- 3/22 • • • • derived from different combinations of signals from separate aerials, e.g. comparing sum with difference
- 3/24 • • • • • the separate aerials comprising one directional aerial and one non-directional aerial, e.g. combination of loop and open aerials producing a reversed cardioid directivity characteristic

- 3/26 • • • • the separate aerials having differently-oriented directivity characteristics
- 3/28 • • • using amplitude comparison of signals derived simultaneously from receiving aerials or aerial systems having differently-oriented directivity characteristics
- 3/30 • • • • derived directly from separate directional systems
- 3/32 • • • • derived from different combinations of signals from separate aerials, e.g. comparing sum with difference
- 3/34 • • • • the separate aerials comprising one directional aerial and one non-directional aerial, e.g. combination of loop and open aerials producing a reversed cardioid directivity characteristic
- 3/36 • • • • the separate aerials having differently-oriented directivity characteristics
- 3/38 • • • using adjustment of real or effective orientation of directivity characteristic of an aerial or an aerial system to give a desired condition of signal derived from that aerial or aerial system, e.g. to give a maximum or minimum signal (G01S 3/16, G01S 3/28 take precedence)
- 3/40 • • • • adjusting orientation of a single directivity characteristic to produce maximum or minimum signal, e.g. rotatable loop aerial, equivalent goniometer system
- 3/42 • • • • the desired condition being maintained automatically
- 3/44 • • • • the adjustment being varied periodically or continuously until it is halted automatically when the desired condition is attained
- 3/46 • • • using aerials spaced apart and measuring phase or time difference between signals therefrom, i.e. path-difference systems
- 3/48 • • • • the waves arriving at the aerials being continuous or intermittent and the phase difference of signals derived therefrom being measured
- 3/50 • • • • the waves arriving at the aerials being pulse modulated and the time difference of their arrival being measured
- 3/52 • • • using a receiving aerial moving, or appearing to move, in a cyclic path to produce a Doppler variation of frequency of the received signal
- 3/54 • • • • the apparent movement of the aerial being produced by coupling the receiver cyclically and sequentially to each of several fixed spaced aerials
- 3/56 • • • Conical-scan beam systems using signals indicative of the deviation of the direction of reception from the scan axis
- 3/58 • • • Rotating or oscillating beam systems using continuous analysis of received signal for determining direction in the plane of rotation or oscillation or for determining deviation from a predetermined direction in such a plane (G01S 3/16 takes precedence)
- 3/60 • • • • Broad-beam systems producing in the receiver a substantially-sinusoidal envelope signal of the carrier wave of the beam, the phase angle of which is dependent upon the angle between the direction of the transmitter from the receiver and a reference direction from the receiver, e.g. cardioid system
- 3/62 • • • • wherein the phase angle of the signal is indicated by a cathode-ray tube
- 3/64 • • • • wherein the phase angle of the signal is determined by phase comparison with a reference alternating signal varying in synchronism with the directivity variation
- 3/66 • • • • Narrow-beam systems producing in the receiver a pulse-type envelope signal of the carrier wave of the beam, the timing of which is dependent upon the angle between the direction of the transmitter from the receiver and a reference direction from the receiver; Overlapping broad-beam systems defining in the receiver a narrow zone and producing a pulse-type envelope signal of the carrier wave of the beam, the timing of which is dependent upon the angle between the direction of the transmitter from the receiver and a reference direction from the receiver
- 3/68 • • • • wherein the timing of the pulse-type envelope signal is indicated by cathode-ray tube
- 3/70 • • • • wherein the timing of the pulse-type envelope signal is determined by bringing a locally-generated pulse-type signal into coincidence or other predetermined time-relationship with the envelope signal
- 3/72 • • Diversity systems specially adapted for direction-finding
- 3/74 • • Multi-channel systems specially adapted for direction-finding, i.e. having a single aerial system capable of giving simultaneous indications of the directions of different signals (systems in which the directions of different signals are determined sequentially and displayed simultaneously G01S 3/04, G01S 3/14)
- 3/78 • using electromagnetic waves other than radio waves
- 3/781 • • Details [5]
- 3/782 • • Systems for determining direction or deviation from predetermined direction [5]
- 3/783 • • • using amplitude comparison of signals derived from static detectors or detector systems [5]
- 3/784 • • • • using a mosaic of detectors [5]
- 3/785 • • • using adjustment of orientation of directivity characteristics of a detector or detector system to give a desired condition of signal derived from that detector or detector system [5]
- 3/786 • • • • the desired condition being maintained automatically [5]
- 3/787 • • • using rotating reticles producing a direction-dependent modulation characteristic [5]
- 3/788 • • • • producing a frequency modulation characteristic [5]
- 3/789 • • • using rotating or oscillating beam systems, e.g. using mirrors, prisms [5]
- 3/80 • using ultrasonic, sonic, or infrasonic waves
- 3/801 • • Details [5]
- 3/802 • • Systems for determining direction or deviation from predetermined direction [5]
- 3/803 • • • using amplitude comparison of signals derived from receiving transducers or transducer systems having differently-oriented directivity characteristics [5]
- 3/805 • • • using adjustment of real or effective orientation of directivity characteristics of a transducer or transducer system to give a desired condition of signal derived from that transducer or transducer system, e.g. to give a maximum or minimum signal [5]

- 3/807 • • • • the desired condition being maintained automatically [5]
- 3/808 • • • using transducers spaced apart and measuring phase or time difference between signals therefrom, i.e. path-difference systems [5]
- 3/809 • • • Rotating or oscillating beam systems using continuous analysis of received signal for determining direction in the plane of rotation or oscillation or for determining deviation from a predetermined direction in such a plane [5]
- 3/82 • • with means for adjusting phase or compensating for time-lag errors
- 3/84 • • with indication presented on cathode-ray tubes
- 3/86 • • with means for eliminating undesired waves, e.g. disturbing noises
- 5/00 Position-fixing by co-ordinating two or more direction or position-line determinations; Position-fixing by co-ordinating two or more distance determinations [2]**
- 5/02 • using radio waves (G01S 19/00 takes precedence) [1, 2010.01]
- 5/04 • • Position of source determined by a plurality of spaced direction-finders
- 5/06 • • Position of source determined by co-ordinating a plurality of position lines defined by path-difference measurements (G01S 5/12 takes precedence) [3]
- 5/08 • • Position of single direction-finder fixed by determining direction of a plurality of spaced sources of known location
- 5/10 • • Position of receiver fixed by co-ordinating a plurality of position lines defined by path-difference measurements (G01S 5/12 takes precedence) [3]
- 5/12 • • by co-ordinating position lines of different shape, e.g. hyperbolic, circular, elliptical or radial
- 5/14 • • Determining absolute distances from a plurality of spaced points of known location
- 5/16 • using electromagnetic waves other than radio waves
- 5/18 • using ultrasonic, sonic, or infrasonic waves
- 5/20 • • Position of source determined by a plurality of spaced direction-finders [5]
- 5/22 • • Position of source determined by co-ordinating a plurality of position lines defined by path-difference measurements (G01S 5/28 takes precedence) [5]
- 5/24 • • Position of single direction-finder fixed by determining direction of a plurality of spaced sources of known location [5]
- 5/26 • • Position of receiver fixed by co-ordinating a plurality of position lines defined by path-difference measurements (G01S 5/28 takes precedence) [5]
- 5/28 • • by co-ordinating position lines of different shape, e.g. hyperbolic, circular, elliptical or radial [5]
- 5/30 • • Determining absolute distances from a plurality of spaced points of known location [5]
- 7/00 Details of systems according to groups G01S 13/00, G01S 15/00, G01S 17/00**
- 7/02 • of systems according to group G01S 13/00
- 7/03 • • Details of HF subsystems specially adapted therefor, e.g. common to transmitter and receiver [5]
- 7/04 • • Display arrangements
- 7/06 • • • Cathode-ray tube displays
- 7/08 • • • • with vernier indication of distance, e.g. using two cathode-ray tubes
- 7/10 • • • • Providing two-dimensional co-ordinated display of distance and direction
- 7/12 • • • • • Plan-position indicators, i.e. P. P. I.
- 7/14 • • • • • Sector, off-centre, or expanded- angle display
- 7/16 • • • • • Signals displayed as intensity modulation with rectangular co-ordinates representing distance and bearing, e.g. type B
- 7/18 • • • • • Distance-height displays; Distance-elevation displays, e.g. type RHI, type E
- 7/20 • • • • Stereoscopic displays; Three-dimensional displays; Pseudo-three-dimensional displays
- 7/22 • • • • Producing cursor lines and indicia by electronic means
- 7/24 • • • • the display being orientated or displaced in accordance with movement of object carrying the transmitting and receiving apparatus, e.g. true-motion radar
- 7/26 • • • Displays using electroluminescent panels
- 7/28 • • Details of pulse systems
- 7/282 • • • Transmitters [5]
- 7/285 • • • Receivers [5]
- 7/288 • • • • Coherent receivers [5]
- 7/292 • • • • Extracting wanted echo-signals [5]
- 7/295 • • • • Means for transforming co-ordinates or for evaluating data, e.g. using computers [5]
- 7/298 • • • • • Scan converters [5]
- 7/32 • • • • Shaping echo pulse signals; Deriving non-pulse signals from echo pulse signals [5]
- 7/34 • • • • Gain of receiver varied automatically during pulse-recurrence period, e.g. anti-clutter gain control [5]
- 7/35 • • Details of non-pulse systems [5]
- 7/36 • • Means for anti-jamming
- 7/38 • • Jamming means, e.g. producing false echoes [2]
- 7/40 • • Means for monitoring or calibrating
- 7/41 • • using analysis of echo signal for target characterisation; Target signature; Target cross-section [6]
- 7/42 • • Diversity systems specially adapted for radar
- 7/48 • of systems according to group G01S 17/00
- 7/481 • • Constructional features, e.g. arrangements of optical elements [6]
- 7/483 • • Details of pulse systems [6]
- 7/484 • • • Transmitters [6]
- 7/486 • • • Receivers [6]
- 7/487 • • • • Extracting wanted echo signals [6]
- 7/489 • • • • Gain of receiver varied automatically during pulse-recurrence period [6]
- 7/491 • • Details of non-pulse systems [6]
- 7/493 • • • Extracting wanted echo signals [6]
- 7/495 • • Counter-measures or counter-counter-measures [6]
- 7/497 • • Means for monitoring or calibrating [6]
- 7/499 • • using polarisation effects [6]
- 7/51 • • Display arrangements [6]
- 7/52 • of systems according to group G01S 15/00
- 7/521 • • Constructional features [6]
- 7/523 • • Details of pulse systems [6]
- 7/524 • • • Transmitters [6]
- 7/526 • • • Receivers [6]
- 7/527 • • • • Extracting wanted echo signals [6]
- 7/529 • • • • Gain of receiver varied automatically during pulse-recurrence period [6]

7/53	• • • • Means for transforming co-ordinates or for evaluating data, e.g. using computers [6]	13/04	• • Systems determining presence of a target (based on relative movement of target G01S 13/56) [3]
7/531	• • • • • Scan converters [6]	13/06	• • Systems determining position data of a target [3]
7/533	• • • • • Data rate converters [6]	13/08	• • • Systems for measuring distance only (indirect measurement G01S 13/46) [3]
7/534	• • Details of non-pulse systems [6]	13/10	• • • • using transmission of interrupted pulse modulated waves (determination of distance by phase measurement G01S 13/32) [3]
7/536	• • • Extracting wanted echo signals [6]	13/12	• • • • • wherein the pulse-recurrence frequency is varied to provide a desired time relationship between the transmission of a pulse and the receipt of the echo of a preceding pulse [3]
7/537	• • Counter measures or counter-counter-measures, e.g. jamming, anti-jamming [6]	13/14	• • • • • wherein a voltage or current pulse is initiated and terminated in accordance respectively with the pulse transmission and echo reception [3]
7/539	• • using analysis of echo signal for target characterisation; Target signature; Target cross-section [6]	13/16	• • • • • • using counters [3]
7/54	• • with receivers spaced apart	13/18	• • • • • wherein range gates are used [3]
7/56	• • Display arrangements	13/20	• • • • • whereby multiple time-around echos are used or eliminated [3]
7/58	• • • for providing variable ranges	13/22	• • • • • using irregular pulse repetition frequency [3]
7/60	• • • for providing a permanent recording	13/24	• • • • • using frequency agility of carrier wave [3]
7/62	• • • Cathode-ray tube displays	13/26	• • • • • wherein the transmitted pulses use a frequency- or phase-modulated carrier wave [3]
7/64	• • Luminous indications (G01S 7/62 takes precedence) [5]	13/28	• • • • • • with time compression of received pulses [3]
<b>11/00</b>	<b>Systems for determining distance or velocity not using reflection or reradiation</b> (position-fixing by co-ordinating two or more distance determinations G01S 5/00) [2]	13/30	• • • • • using more than one pulse per radar period [3]
11/02	• using radio waves (G01S 19/00 takes precedence) [5, 2010.01]	13/32	• • • • using transmission of continuous unmodulated waves, amplitude-, frequency- or phase-modulated waves [3]
11/04	• • using angle measurements [5]	13/34	• • • • • using transmission of frequency-modulated waves and the received signal, or a signal derived therefrom, being heterodyned with a locally-generated signal related to the contemporaneous transmitted signal to give a beat-frequency signal [3]
11/06	• • using intensity measurements [5]	13/36	• • • • • with phase comparison between the received signal and the contemporaneously transmitted signal [3]
11/08	• • using synchronised clocks [5]	13/38	• • • • • • wherein more than one modulation frequency is used [3]
11/10	• • using Doppler effect [5]	13/40	• • • • • • wherein the frequency of transmitted signal is adjusted to give a predetermined phase relationship [3]
11/12	• using electromagnetic waves other than radio waves [5]	13/42	• • • Simultaneous measurement of distance and other coordinates (indirect measurement G01S 13/46) [3]
11/14	• using ultrasonic, sonic or infrasonic waves [5]	13/44	• • • • Monopulse radar, i.e. simultaneous lobing [3]
11/16	• using difference in transit time between electromagnetic and sonic waves [5]	13/46	• • • Indirect determination of position data [3]
	<b>Note(s)</b>	13/48	• • • • using multiple beams at emission or reception [3]
	1. Groups G01S 13/00-G01S 17/00 <u>cover</u> :	13/50	• • Systems of measurement based on relative movement of target [3]
	• systems for detecting the presence of an object, e.g. by reflection or reradiation from the object itself, or from a transponder associated with the object, for determining the distance or relative velocity of an object, for providing a co-ordinated display of the distance and direction of an object or for obtaining an image thereof;	13/52	• • • Discriminating between fixed and moving objects or between objects moving at different speeds [3]
	• systems arranged for mounting on a moving craft or vehicle and using the reflection of waves from an extended surface external to the craft, e.g. the surface of the earth, to determine the velocity and direction of motion of the craft relative to the surface.	13/522	• • • • using transmissions of interrupted pulse modulated waves [5]
	2. Groups G01S 13/00-G01S 17/00 <u>do not cover</u> :		
	• systems for determining the direction of an object by means not employing reflection or reradiation, which are covered by groups G01S 1/00 or G01S 3/00;		
	• systems for determining distance or velocity of an object by means not employing reflection or reradiation, which are covered by group G01S 11/00.		
<b>13/00</b>	<b>Systems using the reflection or reradiation of radio waves, e.g. radar systems; Analogous systems using reflection or reradiation of waves whose nature or wavelength is irrelevant or unspecified</b> [3]		
13/02	• Systems using reflection of radio waves, e.g. primary radar systems; Analogous systems [3]		

- 13/524 • • • • • based upon the phase or frequency shift resulting from movement of objects, with reference to the transmitted signals, e.g. coherent MTi [5]
- 13/526 • • • • • performing filtering on the whole spectrum without loss of range information, e.g. using delay line cancellers or comb filters [5]
- 13/528 • • • • • with elimination of blind speeds [5]
- 13/53 • • • • • performing filtering on a single spectral line and associated with one or more range gates with a phase detector or a frequency mixer to extract the Doppler information, e.g. pulse Doppler radar [5]
- 13/532 • • • • • using a bank of range gates or a memory matrix [5]
- 13/534 • • • • • based upon amplitude or phase shift resulting from movement of objects, with reference to the surrounding clutter echo signal, e.g. non-coherent MTi, clutter referenced MTi, externally coherent MTi [5]
- 13/536 • • • • using transmission of continuous unmodulated waves, amplitude-, frequency-, or phase-modulated waves [5]
- 13/538 • • • • eliminating objects that have not moved between successive antenna scans, e.g. area MTi [5]
- 13/56 • • • • for presence detection [3]
- 13/58 • • • • Velocity or trajectory determination systems; Sense-of-movement determination systems [3]
- 13/60 • • • • wherein the transmitter and receiver are mounted on the moving object, e.g. for determining ground speed, drift angle, ground track (G01S 13/64 takes precedence) [3]
- 13/62 • • • • Sense-of-movement determination [3]
- 13/64 • • • • Velocity measuring systems using range gates [3]
- 13/66 • Radar-tracking systems; Analogous systems [3]
- 13/68 • • for angle tracking only [3]
- 13/70 • • for range tracking only [3]
- 13/72 • • for two-dimensional tracking, e.g. combination of angle and range tracking, track-while-scan radar [3]
- 13/74 • Systems using reradiation of radio waves, e.g. secondary radar systems; Analogous systems [3, 6]
- 13/75 • • using transponders powered from received waves, e.g. using passive transponders [6]
- 13/76 • • wherein pulse-type signals are transmitted [3]
- 13/78 • • discriminating between different kinds of targets, e.g. IFF-radar, i.e. identification of friend or foe (G01S 13/75, G01S 13/79 takes precedence) [3]
- 13/79 • • Systems using random coded signals or random pulse repetition frequencies [6]
- 13/82 • • wherein continuous-type signals are transmitted [3]
- 13/84 • • • for distance determination by phase measurement [3]
- 13/86 • Combinations of radar systems with non-radar systems, e.g. sonar, direction finder [3]
- 13/87 • Combinations of radar systems, e.g. primary radar and secondary radar [3]
- 13/88 • Radar or analogous systems, specially adapted for specific applications (electromagnetic prospecting or detecting of objects, e.g. near-field detection, G01V 3/00) [3, 6]
- 13/89 • • for mapping or imaging [3]
- 13/90 • • • using synthetic aperture techniques [3, 6]
- 13/91 • • for traffic control (G01S 13/93 takes precedence) [3]
- 13/92 • • • for velocity measurement [3]
- 13/93 • • for anti-collision purposes [3]
- 13/94 • • for terrain-avoidance [3]
- 13/95 • • for meteorological use [3]
- 15/00 Systems using the reflection or reradiation of acoustic waves, e.g. sonar systems [3]**
- 15/02 • using reflection of acoustic waves (G01S 15/66 takes precedence) [3]
- 15/04 • • Systems determining presence of a target [3]
- 15/06 • • Systems determining position data of a target [3]
- 15/08 • • • Systems for measuring distance only (indirect measurement G01S 15/46) [3]
- 15/10 • • • • using transmission of interrupted pulse-modulated waves (determination of distance by phase measurement G01S 15/32) [3]
- 15/12 • • • • wherein the pulse-recurrence frequency is varied to provide a desired time relationship between the transmission of a pulse and the receipt of the echo of a preceding pulse [3]
- 15/14 • • • • wherein a voltage or current pulse is initiated and terminated in accordance respectively with the pulse transmission and echo reception [3]
- 15/18 • • • • wherein range gates are used [3]
- 15/32 • • • • using transmission of continuous unmodulated waves, amplitude-, frequency- or phase-modulated waves [3]
- 15/34 • • • • using transmission of frequency-modulated waves and the received signal, or a signal derived therefrom, being heterodyned with a locally-generated signal related to the contemporaneous transmitted signal to give a beat-frequency signal [3]
- 15/36 • • • • with phase comparison between the received signal and the contemporaneously transmitted signal [3]
- 15/42 • • • Simultaneous measurement of distance and other coordinates (indirect measurement G01S 15/46) [3]
- 15/46 • • • Indirect determination of position data [3]
- 15/50 • • Systems of measurement based on relative movement of target [3]
- 15/52 • • Discriminating between fixed and moving objects or between objects moving at different speeds [3]
- 15/58 • • • Velocity or trajectory determination systems; Sense-of-movement determination systems [3]
- 15/60 • • • • wherein the transmitter and receiver are mounted on the moving object, e.g. for determining ground speed, drift angle, ground track [3]
- 15/62 • • • • Sense-of-movement determination [3]
- 15/66 • Sonar tracking systems [3]
- 15/74 • Systems using reradiation of acoustic waves, e.g. IFF, i.e. identification of friend or foe [3]
- 15/87 • Combinations of sonar systems [3]

15/88	• Sonar systems, specially adapted for specific applications (seismic or acoustic prospecting or detecting G01V 1/00) [3, 6]		
15/89	• • for mapping or imaging [3]		
15/93	• • for anti-collision purposes [3]		
15/96	• • for locating fish [3]		
<b>17/00</b>	<b>Systems using the reflection or reradiation of electromagnetic waves other than radio waves, e.g. lidar systems [3]</b>		
17/02	• Systems using the reflection of electromagnetic waves other than radio waves (G01S 17/66 takes precedence) [3]		
17/06	• • Systems determining position data of a target [3]		
17/08	• • • for measuring distance only (indirect measurement G01S 17/46; active triangulation systems G01S 17/48) [3, 2006.01]		
17/10	• • • • using transmission of interrupted pulse-modulated waves (determination of distance by phase measurements G01S 17/32) [3]		
17/32	• • • • using transmission of continuous unmodulated waves, amplitude-, frequency-, or phase-modulated waves [3]		
17/36	• • • • • with phase comparison between the received signal and the contemporaneously transmitted signal [3]		
17/42	• • • Simultaneous measurement of distance and other coordinates (indirect measurement G01S 17/46) [3]		
17/46	• • • Indirect determination of position data [3]		
17/48	• • • Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves [2006.01]		
17/50	• • Systems of measurement based on relative movement of target [3]		
17/58	• • • Velocity or trajectory determination systems; Sense-of-movement determination systems [3]		
17/66	• Tracking systems using electromagnetic waves other than radio waves [3]		
17/74	• Systems using reradiation of electromagnetic waves other than radio waves, e.g. IFF, i.e. identification of friend or foe [3]		
17/87	• Combinations of systems using electromagnetic waves other than radio waves [3]		
17/88	• Lidar systems, specially adapted for specific applications [3]		
17/89	• • for mapping or imaging [6, 2006.01]		
17/93	• • for anti-collision purposes [6, 2006.01]		
17/95	• • for meteorological use [6, 2006.01]		
<b>19/00</b>	<b>Satellite radio beacon positioning systems; Determining position, velocity or attitude using signals transmitted by such systems [2010.01]</b>		
19/01	• Satellite radio beacon positioning systems transmitting time-stamped messages, e.g. GPS [Global Positioning System], GLONASS [Global Orbiting Navigation Satellite System] or GALILEO [2010.01]		
19/02	• • Details of the space or ground control segments [2010.01]		
19/03	• • Cooperating elements; Interaction or communication between different cooperating elements or between cooperating elements and receivers [2010.01]		
		<b>Note(s) [2010.01]</b>	
		The term "cooperating elements" designates additional elements or subsystems, including receivers of other users, which interact or communicate with the receiver or the satellite positioning system.	
		19/04	• • • providing carrier phase data [2010.01]
		19/05	• • • providing aiding data [2010.01]
		19/06	• • • • employing an initial estimate of the location of the receiver as aiding data or in generating aiding data [2010.01]
		19/07	• • • providing data for correcting measured positioning data, e.g. DGPS [differential GPS] or ionosphere corrections [2010.01]
		19/08	• • • providing integrity information, e.g. health of satellites or quality of ephemeris data [2010.01]
		19/09	• • • providing processing capability normally carried out by the receiver [2010.01]
		19/10	• • • providing dedicated supplementary positioning signals [2010.01]
		19/11	• • • • wherein the cooperating elements are pseudolites or satellite radio beacon positioning system signal repeaters [2010.01]
		19/12	• • • • wherein the cooperating elements are telecommunication base stations [2010.01]
		19/13	• • Receivers [2010.01]
		19/14	• • • specially adapted for specific applications [2010.01]
		19/15	• • • • Aircraft landing systems [2010.01]
		19/16	• • • • Anti-theft; Abduction [2010.01]
		19/17	• • • • Emergency applications [2010.01]
		19/18	• • • • Military applications [2010.01]
		19/19	• • • • Sporting applications [2010.01]
		19/20	• • • Integrity monitoring, fault detection or fault isolation of space segment [2010.01]
		19/21	• • • Interference related issues [2010.01]
		19/22	• • • Multipath-related issues [2010.01]
		19/23	• • • Testing, monitoring, correcting or calibrating of a receiver element [2010.01]
		19/24	• • • Acquisition or tracking of signals transmitted by the system [2010.01]
		19/25	• • • • involving aiding data received from a cooperating element, e.g. assisted GPS [2010.01]
		19/26	• • • • involving a sensor measurement for aiding acquisition or tracking [2010.01]
		19/27	• • • • creating, predicting or correcting ephemeris or almanac data within the receiver [2010.01]
		19/28	• • • • Satellite selection [2010.01]
		19/29	• • • • carrier related [2010.01]
		19/30	• • • • code related [2010.01]
		19/31	• • • Acquisition or tracking of other signals for positioning [2010.01]
		19/32	• • • Multimode operation in a single same satellite system, e.g. GPS L1/L2 [2010.01]
		19/33	• • • Multimode operation in different systems which transmit time stamped messages, e.g. GPS/GLONASS [2010.01]
		19/34	• • • Power consumption [2010.01]
		19/35	• • • Constructional details or hardware or software details of the signal processing chain [2010.01]
		19/36	• • • • relating to the receiver front end [2010.01]
		19/37	• • • • Hardware or software details of the signal processing chain [2010.01]

## G01S

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|-------|---|-------|---|
| 19/38 | • Determining a navigation solution using signals transmitted by a satellite radio beacon positioning system <b>[2010.01]</b>   | 19/47 | • • • • • the supplementary measurement being an inertial measurement, e.g. tightly coupled inertial <b>[2010.01]</b>   |
| 19/39 | • • the satellite radio beacon positioning system transmitting time-stamped messages, e.g. GPS [Global Positioning System], GLONASS [Global Orbiting Navigation Satellite System] or GALILEO <b>[2010.01]</b> | 19/48 | • • • • • by combining or switching between position solutions derived from the satellite radio beacon positioning system and position solutions derived from a further system <b>[2010.01]</b> |
| 19/40 | • • • Correcting position, velocity or attitude <b>[2010.01]</b>  | 19/49 | • • • • • whereby the further system is an inertial position system, e.g. loosely-coupled <b>[2010.01]</b>  |
| 19/41 | • • • • • Differential correction, e.g. DGPS [differential GPS] <b>[2010.01]</b>  | 19/50 | • • • • • whereby the position solution is constrained to lie upon a particular curve or surface, e.g. for locomotives on railway tracks <b>[2010.01]</b>                                       |
| 19/42 | • • • • Determining position <b>[2010.01]</b>   | 19/51 | • • • • • Relative positioning <b>[2010.01]</b>   |
| 19/43 | • • • • • using carrier phase measurements, e.g. kinematic positioning; using long or short baseline interferometry <b>[2010.01]</b>  | 19/52 | • • • • Determining velocity <b>[2010.01]</b>   |
| 19/44 | • • • • • Carrier phase ambiguity resolution; Floating ambiguity; LAMBDA [Least-squares AMBIGUITY Decorrelation Adjustment] method <b>[2010.01]</b>   | 19/53 | • • • • Determining attitude <b>[2010.01]</b>   |
| 19/45 | • • • • • by combining measurements of signals from the satellite radio beacon positioning system with a supplementary measurement <b>[2010.01]</b>   | 19/54 | • • • • • using carrier phase measurements; using long or short baseline interferometry <b>[2010.01]</b>  |
| 19/46 | • • • • • the supplementary measurement being of a radio-wave signal type <b>[2010.01]</b>  | 19/55 | • • • • • Carrier phase ambiguity resolution; Floating ambiguity; LAMBDA [Least-squares AMBIGUITY Decorrelation Adjustment] method <b>[2010.01]</b>   |

**G01T MEASUREMENT OF NUCLEAR OR X-RADIATION** (radiation analysis of materials, mass spectrometry G01N 23/00; tubes for determining the presence, intensity, density or energy of radiation or particles H01J 47/00)

### Note(s)

1. This subclass covers the measurement of X-radiation, gamma radiation, corpuscular radiation, cosmic radiation, or neutron radiation.
2. Attention is drawn to the Notes following the title of class G01.

- |       |   |       |   |
|-------|---|-------|---|
| 1/00  | <b>Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation</b> (G01T 3/00, G01T 5/00 take precedence) <b>[2]</b> | 1/169 | • • Exploration, location of contaminated surface areas <b>[2]</b>  |
| 1/02  | • Dosimeters (G01T 1/15 takes precedence) <b>[2]</b>  | 1/17  | • • Circuit arrangements not adapted to a particular type of detector   |
| 1/04  | • • Chemical dosimeters (G01T 1/06, G01T 1/08 take precedence)  | 1/172 | • • • with coincidence circuit arrangements (G01T 1/178 takes precedence) <b>[2]</b>  |
| 1/06  | • • Glass dosimeters  | 1/175 | • • • Power supply circuits <b>[2]</b>  |
| 1/08  | • • Photographic dosimeters   | 1/178 | • • • for measuring specific activity in the presence of other radioactive substances, e.g. natural, in the air or in liquids such as rain-water <b>[2]</b> |
| 1/10  | • • Luminescent dosimeters  | 1/18  | • • with counting-tube arrangements, e.g. with Geiger counters (tubes H01J 47/00)   |
| 1/105 | • • • Read-out devices (G01T 1/115 takes precedence) <b>[2]</b>   | 1/185 | • • with ionisation-chamber arrangements <b>[2]</b>   |
| 1/11  | • • • Thermo-luminescent dosimeters   | 1/20  | • • with scintillation detectors  |
| 1/115 | • • • • Read-out devices <b>[2]</b>   | 1/202 | • • • the detector being a crystal  |
| 1/12  | • • Calorimetric dosimeters   | 1/203 | • • • the detector being made of plastics   |
| 1/14  | • • Electrostatic dosimeters (construction of ionisation chambers H01J 47/02)   | 1/204 | • • • the detector being a liquid   |
| 1/142 | • • • Charging devices; Read-out devices <b>[2]</b>   | 1/205 | • • • the detector being a gas  |
| 1/15  | • Instruments in which pulses generated by a radiation detector are integrated, e.g. by a diode pump circuit                                | 1/208 | • • • Circuits specially adapted for scintillation detectors, e.g. for the photo-multiplier section <b>[2]</b>  |
| 1/16  | • Measuring radiation intensity (G01T 1/29 takes precedence) <b>[2]</b>   | 1/22  | • • with Cerenkov detectors   |
| 1/161 | • • Applications in the field of nuclear medicine, e.g. <u>in vivo</u> counting <b>[2]</b>  | 1/24  | • • with semiconductor detectors  |
| 1/163 | • • • Whole-body counters <b>[2]</b>  | 1/26  | • • with resistance detectors   |
| 1/164 | • • • Scintigraphy <b>[2]</b>   | 1/28  | • • with secondary-emission detectors   |
| 1/166 | • • • • involving relative movement between detector and subject <b>[2]</b>   | 1/29  | • Measurement performed on radiation beams, e.g. position or section of the beam; Measurement of spatial distribution of radiation <b>[2]</b>               |
| 1/167 | • • Measuring radioactive content of objects, e.g. contamination (whole-body counters G01T 1/163) <b>[2]</b>                                | 1/30  | • Measuring half-life of a radioactive substance  |
|       |   | 1/32  | • Measuring polarisation of particles   |

- |  |  |
|--|--|
| <p>1/34 • Measuring cross-section, e.g. absorption cross-section of particles</p> <p>1/36 • Measuring spectral distribution of X-rays or of nuclear radiation</p> <p>1/38 • • Particle discrimination and measurement of relative mass, e.g. by measurement of loss of energy with distance (dE/dx) [2]</p> <p>1/40 • • Stabilisation of spectrometers [2]</p> <p><b>3/00 Measuring neutron radiation</b> (G01T 5/00 takes precedence) [2]</p> <p>3/02 • by shielding other radiation</p> <p>3/04 • using calorimetric devices</p> <p>3/06 • with scintillation detectors [2]</p> <p>3/08 • with semiconductor detectors [2]</p> <p><b>5/00 Recording of movements or tracks of particles</b> (spark chambers H01J 47/14); <b>Processing or analysis of such tracks</b> [2]</p> <p>5/02 • Processing of tracks; Analysis of tracks</p> | <p>5/04 • Cloud chambers, e.g. Wilson chamber</p> <p>5/06 • Bubble chambers</p> <p>5/08 • Scintillation chambers (discharge tubes H01J 40/00, H01J 47/00)</p> <p>5/10 • Plates or blocks in which tracks of nuclear particles are made visible by after-treatment, e.g. using photographic emulsion, using mica</p> <p>5/12 • Circuit arrangements with multi-wire or parallel-plate chambers, e.g. spark chambers (tubes <u>per se</u> H01J 47/00) [2]</p> <p><b>7/00 Details of radiation-measuring instruments</b></p> <p>7/02 • Collecting-means for receiving or storing samples to be investigated</p> <p>7/04 • • by filtration</p> <p>7/06 • • by electrostatic precipitation (G01T 7/04 takes precedence)</p> <p>7/08 • Means for conveying samples received</p> <p>7/10 • • using turntables</p> <p>7/12 • Provision for actuation of an alarm</p> |
|--|--|

**G01V GEOPHYSICS; GRAVITATIONAL MEASUREMENTS; DETECTING MASSES OR OBJECTS; TAGS** (means for indicating the location of accidentally buried, e.g. snow-buried, persons A63B 29/02) [4, 6]

#### Note(s)

1. This subclass covers radar, sonar, lidar or analogous systems specifically designed for geophysical use. Radar, sonar, lidar or analogous systems, or details of such systems, if of a general interest, are also classified in subclass G01S.
2. In this subclass, the following term is used with the meaning indicated:
  - "tags" means arrangements cooperating with a detecting field, e.g. near field, and designed to produce a specific detectable effect; "tags" also means active markers capable of generating a detectable field.
3. In this subclass, the geophysical methods apply both to the earth and to other celestial objects, e.g. planets.
4. Attention is drawn to the Notes following the title of class G01.

#### Subclass index

##### APPARATUS OR METHODS OF PROSPECTING OR DETECTING

Seismic or acoustic.....	1/00
Electric, magnetic; by nuclear radiation; gravimetric; by optical means.....	3/00, 5/00, 7/00, 8/00
Others or combined.....	9/00, 11/00
Detection using tags.....	15/00

##### MEASURING FIELDS

Magnetic; gravitational.....	3/00, 7/00
------------------------------	------------

##### MANUFACTURING, CALIBRATING, MAINTENANCE.....13/00

- |   |   |
|---|---|
| <p><b>1/00 Seismology; Seismic or acoustic prospecting or detecting</b></p> <p>1/02 • Generating seismic energy</p> <p>1/04 • • Details</p> <p>1/047 • • • Arrangements for coupling the generator to the ground [3]</p> <p>1/053 • • • • for generating transverse waves [3]</p> <p>1/06 • • • Ignition devices (G01V 1/393 takes precedence) [3]</p> <p>1/08 • • • • involving time-delay devices</p> <p>1/09 • • • Transporting arrangements, e.g. on vehicles (G01V 1/38 takes precedence) [3]</p> <p>1/104 • • using explosive charges (G01V 1/157 takes precedence) [3]</p> <p>1/108 • • • by deforming or displacing surfaces of enclosures [3]</p> <p>1/112 • • • • for use on the surface of the earth [3]</p> | <p>1/116 • • • where pressurised combustion gases escape from the generator in a pulsating manner, e.g. for generating bursts [3]</p> <p>1/13 • • • Arrangements or disposition of charges to produce a desired pattern in space or time</p> <p>1/133 • • using fluidic driving means, e.g. using highly pressurised fluids (G01V 1/104 takes precedence) [3]</p> <p>1/135 • • • by deforming or displacing surfaces of enclosures [3]</p> <p>1/137 • • • which fluids escape from the generator in a pulsating manner, e.g. for generating bursts [3]</p> <p>1/143 • • using mechanical driving means (G01V 1/104, G01V 1/133 takes precedence) [3]</p> <p>1/145 • • • by deforming or displacing surfaces [3]</p> <p>1/147 • • • using impact of dropping masses [3]</p> <p>1/153 • • • using rotary unbalanced masses [3]</p> <p>1/155 • • • using reciprocating masses [3]</p> <p>1/157 • • using spark discharges; using exploding wires [3]</p> |
|---|---|

- 1/16 • Receiving elements for seismic signals; Arrangements or adaptations of receiving elements
- 1/18 • • Receiving elements, e.g. seismometer, geophone [2]
- 1/20 • • Arrangements of receiving elements, e.g. geophone pattern
- 1/22 • Transmitting seismic signals to recording or processing apparatus
- 1/24 • Recording seismic data
- 1/26 • • Reference-signal-transmitting devices, e.g. indicating moment of firing of shot
- 1/28 • Processing seismic data, e.g. analysis, for interpretation, for correction (G01V 1/48 takes precedence) [6]
- 1/30 • • Analysis (G01V 1/50 takes precedence) [6]
- 1/32 • • Transforming one recording into another
- 1/34 • • Displaying seismic recordings
- 1/36 • • Effecting static or dynamic corrections on records, e.g. correcting spread; Correlating seismic signals; Eliminating effects of unwanted energy
- 1/37 • • • specially adapted for seismic systems using continuous agitation of the ground [3]
- 1/38 • specially adapted for water-covered areas (G01V 1/28 takes precedence)
- 1/387 • • Reducing secondary bubble pulse, i.e. reducing the detected signals resulting from the generation and release of gas bubbles after the primary explosion [3]
- 1/393 • • Means for loading explosive underwater charges, e.g. combined with ignition devices [3]
- 1/40 • specially adapted for well-logging
- 1/42 • • using generators in one well and receivers elsewhere or vice-versa (G01V 1/52 takes precedence) [6]
- 1/44 • • using generators and receivers in the same well (G01V 1/52 takes precedence) [6]
- 1/46 • • • Data acquisition [6]
- 1/48 • • • Processing data [6]
- 1/50 • • • Analysing data [6]
- 1/52 • • Structural details [6]
  
- 3/00 Electric or magnetic prospecting or detecting; Measuring magnetic field characteristics of the earth, e.g. declination or deviation [2, 4]**
- Note(s)**
- Groups G01V 3/15-G01V 3/18 take precedence over groups G01V 3/02-G01V 3/14.
- 3/02 • operating with propagation of electric current
- 3/04 • • using dc
- 3/06 • • using ac
- 3/08 • operating with magnetic or electric fields produced or modified by objects or geological structures or by detecting devices (with electromagnetic waves G01V 3/12)
- 3/10 • • using induction coils
- 3/11 • • • for detecting conductive objects, e.g. firearms, cables or pipes [3]
- 3/12 • operating with electromagnetic waves
- 3/14 • operating with electron or nuclear magnetic resonance
- 3/15 • specially adapted for use during transport, e.g. by a person, vehicle or boat [3]
- 3/16 • • specially adapted for use from aircraft (G01V 3/165-G01V 3/175 take precedence) [3]
  
- 3/165 • • operating with magnetic or electric fields produced or modified by the object or by the detecting device (with electromagnetic waves G01V 3/17) [3]
- 3/17 • • operating with electromagnetic waves [3]
- 3/175 • • operating with electron or nuclear magnetic resonance [3]
- 3/18 • specially adapted for well-logging
- 3/20 • • operating with propagation of electric current [3]
- 3/22 • • • using dc [3]
- 3/24 • • • using ac [3]
- 3/26 • • operating with magnetic or electric fields produced or modified either by the surrounding earth formation or by the detecting device (with electromagnetic waves G01V 3/30) [3]
- 3/28 • • • using induction coils [3]
- 3/30 • • operating with electromagnetic waves [3]
- 3/32 • • operating with electron or nuclear magnetic resonance [3]
- 3/34 • • Transmitting data to recording or processing apparatus; Recording data [3]
- 3/36 • Recording data (G01V 3/34 takes precedence) [3]
- 3/38 • Processing data, e.g. for analysis, for interpretation or for correction [3]
- 3/40 • specially adapted for measuring magnetic field characteristics of the earth [3]
  
- 5/00 Prospecting or detecting by the use of nuclear radiation, e.g. of natural or induced radioactivity**
- 5/02 • specially adapted for surface logging, e.g. from aircraft [3]
- 5/04 • specially adapted for well-logging [3]
- 5/06 • • for detecting naturally radioactive minerals [3]
- 5/08 • • using primary nuclear radiation sources or X-rays [3]
- 5/10 • • • using neutron sources [3]
- 5/12 • • • using gamma- or X-ray sources [3]
- 5/14 • • • using a combination of several sources, e.g. a neutron and a gamma source [3]
  
- 7/00 Measuring gravitational fields or waves; Gravimetric prospecting or detecting**
- 7/02 • Details
- 7/04 • • Electric, photoelectric, or magnetic indicating or recording means
- 7/06 • • Analysis or interpretation of gravimetric records
- 7/08 • using balances
- 7/10 • • using torsion balances, e.g. Eötvös balance
- 7/12 • using pendulums
- 7/14 • using free-fall time
- 7/16 • specially adapted for use on moving platforms, e.g. ship, aircraft
  
- 8/00 Prospecting or detecting by optical means [6]**
- Note(s)**
- This group covers the use of infra-red, visible or ultra-violet light.
- 8/02 • Prospecting [6]
- 8/10 • Detecting, e.g. by using light barriers (by reflection from the object G01S 17/00) [6]
- 8/12 • • using one transmitter and one receiver [6]
- 8/14 • • • using reflectors [6]
- 8/16 • • • using optical fibres [6]
- 8/18 • • • using mechanical scanning systems [6]
- 8/20 • • using multiple transmitters or receivers [6]

8/22	• • • using reflectors [6]	15/00	<b>Tags attached to, or associated with, an object, in order to enable detection of the object</b> (record carriers for use with machines having a detectable tag or marker G06K 19/00) [6]
8/24	• • • using optical fibres [6]		
8/26	• • • using mechanical scanning systems [6]		
9/00	<b>Prospecting or detecting by methods not provided for in groups G01V 1/00-G01V 8/00 [6]</b>		<b>Note(s)</b>
9/02	• Determining existence or flow of underground water		This group <u>does not cover</u> detectors or detection methods, e.g. methods in which the object to be detected produces or modifies magnetic or electric fields, which are covered elsewhere, e.g. in group G01V 3/00.
11/00	<b>Prospecting or detecting by methods combining techniques covered by two or more of main groups G01V 1/00-G01V 9/00</b>		
13/00	<b>Manufacturing, calibrating, cleaning, or repairing instruments or devices covered by groups G01V 1/00-G01V 11/00</b>	99/00	<b>Subject matter not provided for in other groups of this subclass [2009.01]</b>
G01W	<b>METEOROLOGY</b> (radar, sonar, lidar or analogous systems, designed for meteorological use G01S 13/95, G01S 15/88, G01S 17/95)		

**Note(s)**

- In this subclass, the following term is used with the meaning indicated:
  - "meteorology" includes measurement of certain ambient atmospheric conditions.
- Attention is drawn to the Notes following the title of class G01.

1/00	<b>Meteorology</b>	1/08	• Adaptations of balloons, missiles, or aircraft for meteorological purposes; Radiosondes
1/02	• Instruments for indicating weather conditions by measuring two or more variables, e.g. humidity, pressure, temperature, cloud cover, wind speed (G01W 1/10 takes precedence)	1/10	• Devices for predicting weather conditions
1/04	• • giving only separate indications of the variables measured	1/11	• Devices for indicating atmospheric humidity
1/06	• • giving a combined indication of weather conditions (catathermometers for measuring "cooling value" related either to weather conditions or to comfort of other human environment G01W 1/17)	1/12	• Sunshine-duration recorders
		1/14	• Rainfall or precipitation gauges
		1/16	• Measuring atmospheric potential differences, e.g. due to electrical charges in clouds
		1/17	• Catathermometers for measuring "cooling value" related either to weather conditions or to comfort of other human environment
		1/18	• Testing or calibrating meteorological apparatus

**G02 OPTICS****Note(s)**

- In this class, the following expression is used with the meaning indicated:
- "optical" applies not only to visible light but also to ultra-violet or infra-red radiations.

**G02B OPTICAL ELEMENTS, SYSTEMS, OR APPARATUS** (G02F takes precedence; optical elements specially adapted for use in lighting devices or systems thereof F21V 1/00-F21V 13/00; measuring-instruments, see the relevant subclass of class G01, e.g. optical rangefinders G01C; testing of optical elements, systems, or apparatus G01M 11/00; spectacles G02C; apparatus or arrangements for taking photographs or for projecting or viewing them G03B; sound lenses G10K 11/30; electron and ion "optics" H01J; X-ray "optics" H01J, H05G 1/00; optical elements structurally combined with electric discharge tubes H01J 5/16, H01J 29/89, H01J 37/22; microwave "optics" H01Q; combination of optical elements with television receivers H04N 5/72; optical systems or arrangements in colour television systems H04N 9/00; heating arrangements specially adapted for transparent or reflecting areas H05B 3/84) [1, 7]

**Note(s)**

- In this subclass, the following terms or expressions are used with the meanings indicated:
  - "simple lens or prism" means a single lens or prism;
  - "compound lens or prism" means an optical member, the constituents of which either are close together without air-space or (except in group G02B 11/00) are "in broken contact", i.e. with the air-space between the constituents having no essential optical influence;
  - "objective" means a lens or an optical system designed to produce a real image of a real object;

- "eyepiece" means a lens or an optical system designed to produce a virtual image for viewing by the eye or by another optical system;
  - "front" or "rear" is determined by looking from the more distant conjugate.
2. Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "micro-structural devices" and "micro-structural systems".

### Subclass index

#### OPTICAL ELEMENTS

Characterised by their structure: lenses; light guides; other elements.....3/00, 6/00, 5/00  
 Characterised by the material.....1/00

#### OPTICAL SYSTEMS

General structure: number and arrangements of optical components.....9/00, 11/00  
 Special structures: according to purpose; with variable magnification; with reflecting surfaces.....13/00, 15/00, 17/00  
 Other systems.....27/00

#### STRUCTURAL DETAILS OF ARRANGEMENTS COMPRISING LIGHT GUIDES AND OTHER

OPTICAL ELEMENTS.....6/00

#### OPTICAL APPARATUS

Condensers.....19/00  
 Microscopes.....21/00  
 Telescopes, periscopes, instruments for viewing the inside of hollow bodies, viewfinders, aiming or sighting devices.....23/00  
 Eyepieces, magnifying glasses.....25/00  
 Other apparatus.....27/00

CONTROL OF LIGHT.....26/00

MOUNTINGS, ADJUSTING MEANS, LIGHT-TIGHT CONNECTIONS.....7/00

- 
- |       |  |       |   |
|-------|--|-------|---|
| 1/00  | <b>Optical elements characterised by the material of which they are made</b> (compositions of optical glasses C03C 3/00); <b>Optical coatings for optical elements</b> | 5/124 | • • • plural reflecting elements forming part of a unitary plate or sheet [2]   |
| 1/02  | • made of crystals, e.g. rock-salt, semiconductors (G02B 1/08 takes precedence)  | 5/126 | • • including curved refracting surface [2]   |
| 1/04  | • made of organic materials, e.g. plastics (G02B 1/08 takes precedence)  | 5/128 | • • • transparent spheres being embedded in matrix [2]  |
| 1/06  | • made of fluids in transparent cells  | 5/13  | • • • plural curved refracting elements forming part of a unitary body [2]  |
| 1/08  | • made of polarising materials   | 5/132 | • • • with individual reflector mounting means [2]  |
| 1/10  | • Optical coatings produced by application to, or surface treatment of, optical elements (G02B 1/08 takes precedence)  | 5/134 | • • • including a threaded mounting member [2]  |
| 1/11  | • • Anti-reflection coatings [6]   | 5/136 | • • plural reflecting elements forming part of a unitary body (G02B 5/124 takes precedence) [2]                                     |
| 1/12  | • • by surface treatment, e.g. by irradiation  | 5/18  | • Diffracting gratings  |
| 3/00  | <b>Simple or compound lenses</b> (artificial eyes A61F 2/14; spectacle lenses or contact lenses for the eyes G02C; watch or clock glasses G04B 39/00)                  | 5/20  | • Filters (polarising elements G02B 5/30; filters specially adapted for photographic purposes G03B 11/00)                           |
| 3/02  | • with non-spherical faces (G02B 3/10 takes precedence)  | 5/22  | • • Absorbing filters   |
| 3/04  | • • with continuous faces that are rotationally symmetrical but deviate from a true sphere   | 5/23  | • • • Photochromic filters [2]  |
| 3/06  | • • with cylindrical or toric faces  | 5/24  | • • • Liquid filters (G02B 5/23 takes precedence) [2]   |
| 3/08  | • • with discontinuous faces, e.g. Fresnel lens  | 5/26  | • • Reflecting filters (G02B 5/28 takes precedence)   |
| 3/10  | • Bifocal lenses; Multifocal lenses  | 5/28  | • • Interference filters  |
| 3/12  | • Fluid-filled or evacuated lenses   | 5/30  | • Polarising elements (light-modulating devices G02F 1/00)  |
| 3/14  | • • of variable focal length   | 5/32  | • Holograms used as optical elements (processes or apparatus for producing holograms G03H) [2]                                      |
| 5/00  | <b>Optical elements other than lenses</b> (light guides G02B 6/00; optical logic elements G02F 3/00) [4]   | 6/00  | <b>Light guides; Structural details of arrangements comprising light guides and other optical elements, e.g. couplings [4, 6]</b>   |
| 5/02  | • Diffusing elements; Afocal elements  | 6/02  | • Optical fibre with cladding (mechanical structures for providing tensile strength and external protection G02B 6/44) [4, 2006.01] |
| 5/04  | • Prisms   | 6/024 | • • with polarisation-maintaining properties [2006.01]  |
| 5/06  | • • Fluid-filled or evacuated prisms   | 6/028 | • • with core or cladding having graded refractive index [2006.01]  |
| 5/08  | • Mirrors  | 6/032 | • • with non-solid core or cladding [2006.01]   |
| 5/09  | • • Multifaceted or polygonal mirrors [6]  | 6/036 | • • core or cladding comprising multiple layers [2006.01]   |
| 5/10  | • • with curved faces  | 6/04  | • formed by bundles of fibres (G02B 6/24 takes precedence) [4]  |
| 5/12  | • Reflex reflectors  |       |   |
| 5/122 | • • cube corner, trihedral or triple reflector type [2]  |       |   |

- 6/06 • • the relative position of the fibres being the same at both ends, e.g. for transporting images [4]
- 6/08 • • • with fibre bundle in form of plate [4]
- 6/10 • of the optical waveguide type (G02B 6/02, G02B 6/24 take precedence; devices or arrangements for the control of light by electric, magnetic, electro-magnetic or acoustic means G02F 1/00; transferring the modulation of modulated light G02F 2/00; optical logic elements G02F 3/00; optical analogue/digital converters G02F 7/00; stores using opto-electronic devices G11C 11/42; electric waveguides H01P; transmission of information by optical means H04B 10/00; multiplex systems H04J 14/00) [4, 2006.01]
- 6/12 • • of the integrated circuit kind (production or processing of single crystals C30B; electric integrated circuits H01L 27/00) [4]
- 6/122 • • • Basic optical elements, e.g. light-guiding paths [6]
- 6/124 • • • • Geodesic lenses or integrated gratings [6]
- 6/125 • • • • Bends, branchings or intersections [6]
- 6/126 • • • using polarisation effects [6]
- 6/13 • • • Integrated optical circuits characterised by the manufacturing method [6]
- 6/132 • • • • by deposition of thin films [6]
- 6/134 • • • • by substitution by dopant atoms [6]
- 6/136 • • • • by etching [6]
- 6/138 • • • • by using polymerisation [6]
- 6/14 • • Mode converters [4]
- 6/24 • Coupling light guides (for electric waveguides H01P 1/00) [4, 5]
- 6/245 • • Removing protective coverings of light guides before coupling [5]
- 6/25 • • Preparing the ends of light guides for coupling, e.g. cutting [5]
- 6/255 • • Splicing of light guides, e.g. by fusion or bonding [5]
- 6/26 • • Optical coupling means (G02B 6/36, G02B 6/42 take precedence) [4]
- 6/27 • • • with polarisation selective and adjusting means (polarisation elements in general G02B 5/30; polarisation systems in general G02B 27/28; optical polarisation multiplex systems H04J 14/06) [6]
- 6/28 • • • having data bus means, i.e. plural waveguides interconnected and providing an inherently bidirectional system by mixing and splitting signals [4]
- 6/287 • • • • Structuring of light guides to shape optical elements with heat application (G02B 6/255 takes precedence) [6]
- 6/293 • • • • with wavelength selective means (for optical elements in use, see the relevant subgroups of this subclass; optical wavelength-division multiplexing systems H04J 14/02) [6]
- 6/30 • • • for use between fibre and thin-film device [4]
- 6/32 • • • having lens focusing means [4]
- 6/34 • • • utilising prism or grating [4]
- 6/35 • • • having switching means (optical switching in general G02B 26/08; by changing the optical properties of the medium G02F 1/00) [6]
- 6/36 • • Mechanical coupling means (G02B 6/255, G02B 6/42 take precedence) [4, 5]
- 6/38 • • • having fibre to fibre mating means [4]
- 6/40 • • • having fibre bundle mating means [4]
- 6/42 • • Coupling light guides with opto-electronic elements [4]
- 6/43 • • • Arrangements comprising a plurality of opto-electronic elements and associated optical interconnections (light-emissive or light-sensitive semiconductor devices H01L 27/00, H01L 31/00, H01L 33/00; semiconductor lasers monolithically integrated with other components H01S 5/026) [6]
- 6/44 • Mechanical structures for providing tensile strength and external protection for fibres, e.g. optical transmission cables (cables incorporating electric conductors and optical fibres H01B 11/22) [4]
- 6/46 • Processes or apparatus adapted for installing optical fibres or optical cables (installation of cables containing electric conductors and optical fibres H02G) [6]
- 6/48 • • Overhead installation [6]
- 6/50 • • Underground or underwater installation; Installation through tubing, conduits or ducts [6]
- 6/52 • • • using fluid, e.g. air [6]
- 6/54 • • • using mechanical means, e.g. pulling or pushing devices [6]
- 7/00 Mountings, adjusting means, or light-tight connections, for optical elements**
- 7/02 • for lenses
- 7/04 • • with mechanism for focusing or varying magnification [2]
- 7/06 • • • Focusing binocular pairs
- 7/08 • • • adapted to co-operate with a remote control mechanism
- 7/09 • • • adapted for automatic focusing or varying magnification (automatic generation of focusing signals G02B 7/28) [5]
- 7/10 • • • by relative axial movement of several lenses, e.g. of varifocal objective lens
- 7/105 • • • • with movable lens means specially adapted for focusing at close distances [4]
- 7/12 • • Adjusting pupillary distance of binocular pairs
- 7/14 • • adapted to interchange lenses
- 7/16 • • • Rotatable turrets
- 7/18 • for prisms; for mirrors
- 7/182 • • for mirrors (optical devices or arrangements using movable or deformable optical elements for controlling the intensity, colour, phase, polarisation or direction of light G02B 26/00) [5]
- 7/183 • • • specially adapted for very large mirrors, e.g. for astronomy (G02B 7/185, G02B 7/192, G02B 7/198 take precedence) [6]
- 7/185 • • • with means for adjusting the shape of the mirror surface (mirrors with curved faces G02B 5/10) [5]
- 7/188 • • • • Membrane mirrors [5]
- 7/192 • • • with means for minimising internal mirror stresses [5]
- 7/195 • • • • Fluid-cooled mirrors [5]
- 7/198 • • • with means for adjusting the mirror relative to its support [5]
- 7/20 • Light-tight connections for movable optical elements
- 7/22 • • Extensible connections, e.g. bellows
- 7/24 • • Pivoted connections
- 7/28 • Systems for automatic generation of focusing signals (measuring distance per se G01C, G01S; using such signals to control focus of particular apparatus, see the subclasses for the apparatus, e.g. G03B, G03F) [5]
- 7/30 • • using parallax triangle with a base line [5]
- 7/32 • • • using active means, e.g. light emitter [5]

- 7/34 • • using different areas in a pupil plane [5]
- 7/36 • • using image sharpness techniques [5]
- 7/38 • • • measured at different points on the optical axis [5]
- 7/40 • • using time delay of the reflected waves, e.g. of ultrasonic waves [5]

**9/00 Optical objectives characterised both by the number of the components and their arrangements according to their sign, i.e. + or – (G02B 13/00, G02B 15/00 take precedence)**

**Note(s)**

In this group, a component is deemed to be a simple lens or a compound lens or a divided lens equivalent to a simple or to a compound lens.

- 9/02 • having one + component only (simple lenses G02B 3/00)
- 9/04 • having two components only
- 9/06 • • two + components
- 9/08 • • • arranged about a stop
- 9/10 • • one + and one – component
- 9/12 • having three components only
- 9/14 • • arranged + – +
- 9/16 • • • all the components being simple
- 9/18 • • • only one component having a compound lens (G02B 9/30 takes precedence)
- 9/20 • • • • the rear component having the compound
- 9/22 • • • • the middle component having the compound
- 9/24 • • • two of the components having compound lenses (G02B 9/30 takes precedence)
- 9/26 • • • • the front and rear components having compound lenses
- 9/28 • • • • the middle and rear components having compound lenses
- 9/30 • • • the middle component being a – compound meniscus having a + lens
- 9/32 • • • • the + lens being a meniscus
- 9/34 • having four components only
- 9/36 • • arranged + — +

**Note(s)**

In this group, the first place priority rule is applied.

- 9/38 • • • both – components being meniscus
- 9/40 • • • • one – component being compound
- 9/42 • • • • two – components being compound
- 9/44 • • • both – components being biconcave
- 9/46 • • • • one – component being compound
- 9/48 • • • • two – components being compound
- 9/50 • • • both + components being meniscus
- 9/52 • • • the rear + component being compound
- 9/54 • • • the front + component being compound
- 9/56 • • • all components being simple lenses
- 9/58 • • arranged – + + –
- 9/60 • having five components only
- 9/62 • having six components only
- 9/64 • having more than six components

**11/00 Optical objectives characterised by the total number of simple and compound lenses forming the objective and their arrangement (G02B 9/00 takes precedence; having only one simple lens G02B 3/00)**

**Note(s)**

In groups G02B 11/02-G02B 11/34, lenses in broken contact are counted separately. Simple lenses are denoted by L, compound lenses by C, and the front lens is mentioned first.

- 11/02 • having two lenses only
- 11/04 • • arranged C C
- 11/06 • having three lenses only
- 11/08 • • arranged L L L
- 11/10 • • arranged L C L
- 11/12 • • arranged L L C
- 11/14 • • arranged C L C
- 11/16 • • arranged C C L
- 11/18 • • arranged C C C
- 11/20 • having four lenses only
- 11/22 • • arranged L L L L
- 11/24 • • arranged C L L C
- 11/26 • • arranged L C C L
- 11/28 • • arranged C C C C
- 11/30 • having five lenses only
- 11/32 • having six lenses only
- 11/34 • having more than six lenses

**13/00 Optical objectives specially designed for the purposes specified below (with variable magnification G02B 15/00)**

- 13/02 • Telephoto objectives, i.e. systems of the type + – in which the distance from the front vertex to the image plane is less than the equivalent focal length
- 13/04 • Reversed telephoto objectives
- 13/06 • Panoramic objectives; So-called "sky lenses"
- 13/08 • Anamorphic objectives
- 13/10 • • involving prisms (G02B 13/12 takes precedence)
- 13/12 • • with variable magnification
- 13/14 • for use with infra-red or ultra-violet radiation (G02B 13/16 takes precedence)
- 13/16 • for use in conjunction with image converters or intensifiers
- 13/18 • with lenses having one or more non-spherical faces, e.g. for reducing geometrical aberration
- 13/20 • Soft-focus objectives (diffusing elements in general G02B 5/02)
- 13/22 • Telecentric objectives or lens systems
- 13/24 • for reproducing or copying at short object distances
- 13/26 • • for reproducing with unit magnification [3]

**15/00 Optical objectives with means for varying the magnification (anamorphic objectives G02B 13/08)**

- 15/02 • by changing, adding, or subtracting a part of the objective, e.g. convertible objective
- 15/04 • • by changing a part
- 15/06 • • • by changing the front part
- 15/08 • • • by changing the rear part
- 15/10 • • by adding a part, e.g. close-up attachment
- 15/12 • • • by adding telescopic attachments (G02B 15/14 takes precedence)
- 15/14 • by axial movement of one or more lenses or groups of lenses relative to the image plane for continuously varying the equivalent focal length of the objective [4]
- 15/15 • • compensation by means of only one movement or by means of only linearly related movements, e.g. optical compensation [4]

- 15/16 • • with interdependent non-linearly related movements between one lens or lens group, and another lens or lens group (G02B 15/22 takes precedence) [4]
- 15/163 • • • having a first movable lens or lens group and a second movable lens or lens group, both in front of a fixed lens or lens group (G02B 15/177 takes precedence) [4]
- 15/167 • • • having an additional fixed front lens or group of lenses [4]
- 15/17 • • • • arranged + — [4]
- 15/173 • • • • • arranged + — + [4]
- 15/177 • • • having a negative front lens or group of lenses [4]
- 15/20 • • • having an additional movable lens or lens group for varying the objective focal length [4]
- 15/22 • • with movable lens means specially adapted for focusing at close distances [4]
- 15/24 • • • having a front fixed lens or lens group and two movable lenses or lens groups in front of a fixed lens or lens group [4]
- 15/26 • • • • arranged + — [4]
- 15/28 • • • • arranged + — + [4]
- 17/00 Systems with reflecting surfaces, with or without refracting elements** (microscopes G02B 21/00; telescopes, periscopes G02B 23/00; beam shaping not otherwise provided for G02B 27/09; for beam splitting or combining G02B 27/10; for optical projection G02B 27/18) [6]
- 17/02 • Catoptric systems, e.g. image erecting and reversing system
- 17/04 • • using prisms only
- 17/06 • • using mirrors only
- 17/08 • Catadioptric systems
- 19/00 Condensers** (for microscopes G02B 21/08)
- 21/00 Microscopes** (eyepieces G02B 25/00; polarising systems G02B 27/28; measuring microscopes G01B 9/04; microtomes G01N 1/06; scanning-probe techniques or apparatus G01Q) [1, 7]
- 21/02 • Objectives
- 21/04 • • involving mirrors
- 21/06 • Means for illuminating specimen
- 21/08 • • Condensers
- 21/10 • • • affording dark-field illumination (G02B 21/14 takes precedence)
- 21/12 • • • affording bright-field illumination (G02B 21/14 takes precedence)
- 21/14 • • • affording illumination for phase-contrast observation
- 21/16 • adapted for ultra-violet illumination
- 21/18 • Arrangements with more than one light-path, e.g. for comparing two specimens
- 21/20 • • Binocular arrangements
- 21/22 • • • Stereoscopic arrangements
- 21/24 • Base structure
- 21/26 • • Stages; Adjusting means therefor
- 21/28 • • with cooling device
- 21/30 • • with heating device
- 21/32 • Micromanipulators structurally combined with microscopes
- 21/33 • Immersion oils [6]
- 21/34 • Microscope slides, e.g. mounting specimens on microscope slides (preparing specimens for investigation G01N 1/28; means for supporting the objects or the materials to be analysed in electron microscopes H01J 37/20)
- 21/36 • arranged for photographic purposes or projection purposes (G02B 21/18 takes precedence)
- 23/00 Telescopes, e.g. binoculars** (measuring telescopes G01B 9/06); **Periscopes; Instruments for viewing the inside of hollow bodies** (diagnostic instruments A61B); **Viewfinders** (objectives G02B 9/00, G02B 11/00, G02B 15/00, G02B 17/00; eyepieces G02B 25/00); **Optical aiming or sighting devices** (non-optical aspects of weapon aiming or sighting devices F41G) [4]
- 23/02 • involving prisms or mirrors (G02B 23/14 takes precedence)
- 23/04 • • for the purpose of beam splitting or combining, e.g. fitted with eyepieces for more than one observer (G02B 23/10 takes precedence)
- 23/06 • • having a focusing action, e.g. parabolic mirror
- 23/08 • • Periscopes
- 23/10 • • reflecting into the field of view additional indications, e.g. from collimator (collimators in general G02B 27/30; graticules G02B 27/34)
- 23/12 • with means for image conversion or intensification (objectives for image conversion or intensification G02B 13/16; electrical image converters with optical input and optical output H01J 31/50)
- 23/14 • Viewfinders (for photographic apparatus G03B 13/02)
- 23/16 • Housings; Caps; Mountings; Supports, e.g. with counterweight (cases or receptacles A45C)
- 23/18 • • for binocular arrangements
- 23/20 • • Collapsible housings (G02B 23/18 takes precedence)
- 23/22 • • Underwater equipments, e.g. for submarine periscope
- 23/24 • Instruments for viewing the inside of hollow bodies, e.g. fibrescopes [4]
- 23/26 • • using light guides [4]
- 25/00 Eyepieces; Magnifying glasses** (simple lenses G02B 3/00)
- 25/02 • with means for illuminating object viewed
- 25/04 • affording a wide-angle view, e.g. through a spy-hole
- 26/00 Optical devices or arrangements using movable or deformable optical elements for controlling the intensity, colour, phase, polarisation or direction of light, e.g. switching, gating, modulating** (mechanically operable parts of lighting devices for the control of light order F21V; specially adapted for measuring characteristics of light G01J; devices or arrangements, the optical operation of which is modified by changing the optical properties of the medium of the devices or arrangements G02F 1/00; control of light in general G05D 25/00; control of light sources H01S 3/10, H05B 37/00-H05B 43/00) [4]
- 26/02 • for controlling the intensity of light [4]
- 26/04 • • by periodically varying the intensity of light, e.g. using choppers [4]
- 26/06 • for controlling the phase of light (G02B 26/08 takes precedence) [4]
- 26/08 • for controlling the direction of light (in light guides G02B 6/35) [4]

## G02B

- 26/10 • • Scanning systems (for special applications, see the relevant places, e.g. G03B 27/32, G03F 3/08, G03G 15/04, G09G 3/00, H04N) [4]
- 26/12 • • • using multifaceted mirrors [6]
- 27/00 Other optical systems; Other optical apparatus**  
(means for bringing-about special optical effects in shop-windows, showcases A47F, e.g. A47F 11/06; optical toys A63H 33/22; designs or pictures characterised by special light effects B44F 1/00)
- 27/01 • Head-up displays [6]
- 27/02 • Viewing or reading apparatus (stereoscopic systems G02B 27/22; of the projection type G03B; slide-changing apparatus G03B)
- 27/04 • • having collapsible parts
- 27/06 • • with moving-picture effect
- 27/08 • • Kaleidoscopes
- 27/09 • Beam shaping, e.g. changing the cross-sectioned area, not otherwise provided for [6]
- 27/10 • Beam splitting or combining systems (mixing and splitting light signals using optical waveguides G02B 6/28; polarising systems G02B 27/28) [4]
- 27/12 • • operating by refraction only
- 27/14 • • operating by reflection only
- 27/16 • • used as aids for focusing
- 27/18 • for optical projection, e.g. combination of mirror and condenser and objective
- 27/20 • • for imaging minute objects, e.g. light-pointer
- 27/22 • for producing stereoscopic or other three-dimensional effects (in microscopes G02B 21/22; viewing apparatus G02B 27/02)
- 27/24 • • involving reflecting prisms and mirrors only
- 27/26 • • involving polarising means
- 27/28 • for polarising (used in stereoscopes G02B 27/26)
- 27/30 • Collimators

- 27/32 • Fiducial marks or measuring scales within the optical system
- 27/34 • • illuminated
- 27/36 • • adjustable
- 27/40 • Optical focusing aids (beam splitting or combining systems G02B 27/10)
- 27/42 • Diffraction optics (G02B 27/60 takes precedence) [3]
- 27/44 • • Grating systems; Zone plate systems (G02B 27/46 takes precedence; spectrometry G01J) [3]
- 27/46 • • Systems using spatial filters (character recognition G06K 9/00) [3]

### Note(s)

In this group, the filter may be in any plane, e.g. the image or the Fourier transfer plane.

- 27/48 • Laser speckle optics (speckle suppression in holography G03H 1/32) [3]
- 27/50 • Optics for phase object visualisation (in microscopes G02B 21/14) [3]
- 27/52 • • Phase contrast optics [3]
- 27/54 • • Schlieren-optical systems [3]
- 27/56 • Optics using evanescent waves, i.e. inhomogeneous waves [3]
- 27/58 • Optics for apodization or superresolution; Optical synthetic aperture systems [3]
- 27/60 • Systems using moire fringes (means for converting the output of a sensing member using diffraction gratings G01D 5/38) [3]
- 27/62 • Optical apparatus specially adapted for adjusting optical elements during the assembly of optical systems (adjusting means being part of the system to be assembled G02B 7/00) [3]
- 27/64 • Imaging systems using optical elements for stabilisation of the lateral and angular position of the image (focusing systems G02B 7/04; adjustment of optical system relative to image or object surface G03B 5/00) [3]

## G02C SPECTACLES; SUNGLASSES OR GOGGLES INsofar AS THEY HAVE THE SAME FEATURES AS SPECTACLES; CONTACT LENSES

### Note(s)

This subclass also covers monacles, pince-nez or lorgnettes.

### Subclass index

OPTICAL PARTS.....	7/00
NON-OPTICAL PARTS	
Supporting arrangements; adjuncts.....	3/00, 5/00, 11/00
ATTACHMENTS OF OPTICAL PARTS TO NON-OPTICAL PARTS	
Principal; auxiliary.....	1/00, 9/00
ASSEMBLING, REPAIRING, CLEANING.....	13/00

### **1/00 Assemblies of lenses with bridges or browbars**

- 1/02 • Bridge or browbar secured to lenses without the use of rims
- 1/04 • Bridge or browbar secured to, or integral with, partial rims, e.g. with partially-flexible rim for holding the lens
- 1/06 • Bridge or browbar secured to, or integral with, closed rigid rims for the lenses
- 1/08 • • the rims being transversely-split and provided with securing means

### **3/00 Special supporting arrangement for lens assemblies or monacles**

- 3/02 • Arrangements for supporting by headgear
- 3/04 • Arrangements for supporting by hand, e.g. lorgnette; Arrangements for supporting by articles

### **5/00 Constructions of non-optical parts**

- 5/02 • Bridges; Browbars; Intermediate bars (nose-engaging surfaces G02C 5/12)
- 5/04 • • with adjustable means

- 5/06 • • with resilient means
- 5/08 • • foldable
- 5/10 • • Intermediate bar or bars between bridge and side-members
- 5/12 • Nose-pads; Nose-engaging surfaces of bridges or rims
- 5/14 • Side-members
- 5/16 • • resilient or with resilient parts
- 5/18 • • reinforced
- 5/20 • • adjustable, e.g. telescopic
- 5/22 • Hinges
- 7/00 Optical parts** (characterised by the material G02B 1/00)
  - 7/02 • Lenses; Lens systems
  - 7/04 • • Contact lenses for the eyes
  - 7/06 • • bifocal; multifocal
  - 7/08 • • Auxiliary lenses; Arrangements for varying focal length
  - 7/10 • Filters, e.g. for facilitating adaptation of the eyes to the dark; Sunglasses
- 7/12 • Polarisers
- 7/14 • Mirrors; Prisms
- 7/16 • Shades, shields; Obturators, e.g. with pinhole, with slot
- 9/00 Attaching auxiliary optical parts**
  - 9/02 • by hinging
  - 9/04 • by fitting over or clamping on
- 11/00 Non-optical adjuncts; Attachment thereof** (G02C 7/16 takes precedence)
  - 11/02 • Ornaments, e.g. exchangeable
  - 11/04 • Illuminating means
  - 11/06 • Hearing aids (construction of hearing aids H04R 25/00)
  - 11/08 • Anti-misting means, e.g. ventilating, heating; Wipers (H05B 3/84 takes precedence) [5]
- 13/00 Assembling; Repairing; Cleaning** (disinfection or sterilisation of contact lenses A61L 12/00)

**G02F DEVICES OR ARRANGEMENTS, THE OPTICAL OPERATION OF WHICH IS MODIFIED BY CHANGING THE OPTICAL PROPERTIES OF THE MEDIUM OF THE DEVICES OR ARRANGEMENTS FOR THE CONTROL OF THE INTENSITY, COLOUR, PHASE, POLARISATION OR DIRECTION OF LIGHT, e.g. SWITCHING, GATING, MODULATING OR DEMODULATING; TECHNIQUES OR PROCEDURES FOR THE OPERATION THEREOF; FREQUENCY-CHANGING; NON-LINEAR OPTICS; OPTICAL LOGIC ELEMENTS; OPTICAL ANALOGUE/DIGITAL CONVERTERS [2, 4]**

- 1/00 Devices or arrangements for the control of the intensity, colour, phase, polarisation or direction of light arriving from an independent light source, e.g. switching, gating or modulating; Non-linear optics [2, 4]**
  - Note(s)**
  - This group covers only:
    - devices or arrangements, e.g. cells, the optical operation of which is modified by changing the optical properties of the medium of the devices or arrangements by the influence or control of physical parameters, e.g. electric fields, electric current, magnetic fields, sound or mechanical vibrations, stress or thermal effects;
    - devices or arrangements in which the electric or magnetic field component of the light beams influences the optical properties of the medium, i.e. non-linear optics;
    - control of light by electromagnetic waves, e.g. radio waves, or by electrons or other elementary particles.
  - 1/01 • for the control of the intensity, phase, polarisation or colour (G02F 1/29, G02F 1/35 take precedence) [2, 7]
  - 1/015 • • based on semiconductor elements with at least one potential jump barrier, e.g. PN, PIN junction (G02F 1/03 takes precedence) [3]
  - 1/017 • • • Structures with periodic or quasi periodic potential variation, e.g. superlattices, quantum wells [7]
  - 1/025 • • • in an optical waveguide structure (G02F 1/017 takes precedence) [5, 7]
  - 1/03 • • based on ceramics or electro-optical crystals, e.g. exhibiting Pockels or Kerr effect (G02F 1/061 takes precedence) [2, 4, 7]
  - 1/035 • • • in an optical waveguide structure [5]
  - 1/05 • • • with ferro-electric properties (G02F 1/035, G02F 1/055 take precedence) [2, 5]
  - 1/055 • • • the active material being a ceramic (G02F 1/035 takes precedence) [4, 5]
  - 1/061 • • based on electro-optical organic material (G02F 1/07 takes precedence) [7]
  - 1/065 • • • in an optical waveguide structure [7]
  - 1/07 • • based on electro-optical liquids exhibiting Kerr effect [2]
  - 1/09 • • based on magneto-optical elements, e.g. exhibiting Faraday effect [2]
  - 1/095 • • • in an optical waveguide structure [5]
  - 1/11 • • based on acousto-optical elements, e.g. using variable diffraction by sound or like mechanical waves (acousto-optical deflection G02F 1/33) [2]
  - 1/125 • • • in an optical waveguide structure [5]
  - 1/13 • • based on liquid crystals, e.g. single liquid crystal display cells [2]
  - 1/133 • • • Constructional arrangements; Operation of liquid crystal cells; Circuit arrangements (arrangements or circuits for control of liquid crystal elements in a matrix, not structurally associated with these elements G09G 3/36) [3, 7]
  - 1/1333 • • • • Constructional arrangements (G02F 1/135, G02F 1/136 take precedence) [5]
  - 1/1334 • • • • based on polymer-dispersed liquid crystals, e.g. microencapsulated liquid crystals [7]
  - 1/1335 • • • • Structural association of optical devices, e.g. polarisers, reflectors, with the cell [5]
  - 1/13357 • • • • • Illuminating devices [7]
  - 1/13363 • • • • • Birefringent elements, e.g. for optical compensation [7]

## G02F

- 1/1337 • • • • • Surface-induced orientation of the liquid crystal molecules, e.g. by alignment layers [5]
- 1/1339 • • • • • Gaskets; Spacers; Sealing of the cell [5]
- 1/1341 • • • • • Filling or closing of the cell [5]
- 1/1343 • • • • • Electrodes [5]
- 1/1345 • • • • • Conductors connecting electrodes to cell terminals [5]
- 1/1347 • • • • • Arrangement of liquid crystal layers or cells in which the final condition of one light beam is achieved by the addition of the effects of two or more layers or cells [5]
- 1/135 • • • • • Liquid crystal cells structurally associated with a photoconducting or a ferro-electric layer, the properties of which can be optically or electrically varied [3]
- 1/136 • • • • • Liquid crystal cells structurally associated with a semi-conducting layer or substrate, e.g. cells forming part of an integrated circuit (G02F 1/135 takes precedence) [5]
- 1/1362 • • • • • Active matrix addressed cells [7]
- 1/1365 • • • • • in which the switching element is a two-electrode device [7]
- 1/1368 • • • • • in which the switching element is a three-electrode device [7]
- 1/137 • • • characterised by a particular electro- or magneto-optical effect, e.g. field-induced phase transition, orientation effect, guest-host interaction, dynamic scattering [3]
- 1/139 • • • • • based on orientation effects in which the liquid crystal remains transparent [6]
- 1/141 • • • • • using ferroelectric liquid crystals [6]
- 1/15 • • based on electrochromic elements [5]
- 1/153 • • • Constructional arrangements [5]
- 1/155 • • • • Electrodes [5]
- 1/157 • • • • Structural association of optical devices, e.g. reflectors or illuminating devices, with the cell [5]
- 1/161 • • • • Gaskets; Spacers; Sealing of the cell; Filling or closing of the cell [5]
- 1/163 • • • Operation of electrochromic cells; Circuit arrangements [5]
- 1/167 • • based on electrophoresis [5]
- 1/17 • • based on variable absorption elements (G02F 1/015-G02F 1/167 take precedence) [2, 5]
- 1/19 • • based on variable reflection or refraction elements (G02F 1/015-G02F 1/167 take precedence) [2, 5]
- 1/21 • • by interference [2]
- 1/225 • • • in an optical waveguide structure [5]
- 1/23 • • for the control of the colour (G02F 1/03-G02F 1/21 take precedence) [2]
- 1/25 • • • as to hue or predominant wavelength [2]
- 1/29 • for the control of the position or the direction of light beams, i.e. deflection [4]
- 1/295 • • in an optical waveguide structure (G02F 1/313, G02F 1/335 take precedence) [5]
- 1/31 • • Digital deflection devices (G02F 1/33 takes precedence) [2]
- 1/313 • • • in an optical waveguide structure [5]
- 1/315 • • • based on the use of controlled total internal reflection [3]
- 1/33 • • Acousto-optical deflection devices [2]
- 1/335 • • • having an optical waveguide structure [5]
- 1/35 • Non-linear optics [2, 5]
- 1/355 • • characterised by the materials used [7]
- 1/361 • • • Organic materials [7]
- 1/365 • • in an optical waveguide structure (G02F 1/377 takes precedence) [7]
- 1/37 • • for second-harmonic generation [2]
- 1/377 • • • in an optical waveguide structure [7]
- 1/383 • • • • of the optical fibre type [7]
- 1/39 • • for parametric generation or amplification of light, infra-red, or ultra-violet waves [2]
- 2/00 **Demodulating light; Transferring the modulation of modulated light; Frequency-changing of light** (G02F 1/35 takes precedence) [2]
- 2/02 • Frequency-changing of light, e.g. by quantum counters [2]
- 3/00 **Optical logic elements; Optical bistable devices** [5]
- 3/02 • Optical bistable devices [5]
- 7/00 **Optical analogue/digital converters**  
**Note(s)**  
This group covers only converters based in substantial manner on elements which are provided for in group G02F 1/00.

## G03 PHOTOGRAPHY; CINEMATOGRAPHY; ANALOGOUS TECHNIQUES USING WAVES OTHER THAN OPTICAL WAVES; ELECTROGRAPHY; HOLOGRAPHY

### Note(s)

1. This class does not cover reproduction of pictures or patterns by scanning and converting into electrical signals, which is covered by subclass H04N.
2. In this class, the following terms are used with the meaning indicated:
  - "records" means photographs or any other kind of latent, directly-visible or permanent storage of pictorial information, which consist of an imagewise distribution of a quantity, e.g. an electric charge pattern, recorded on a carrier member;
  - "optical" applies not only to visible light but also to ultra-violet or infra-red radiations.

**G03B APPARATUS OR ARRANGEMENTS FOR TAKING PHOTOGRAPHS OR FOR PROJECTING OR VIEWING THEM; APPARATUS OR ARRANGEMENTS EMPLOYING ANALOGOUS TECHNIQUES USING WAVES OTHER THAN OPTICAL WAVES; ACCESSORIES THEREFOR** (optical parts of such apparatus G02B; photosensitive materials or processes for photographic purposes G03C; apparatus for processing exposed photographic materials G03D) [4]

**Note(s)**

This subclass covers, as far as processes are concerned, only processes characterised by the use or manipulation of apparatus classifiable per se in this subclass.

**Subclass index**

## DETAILS

Common to at least two of cameras, projectors and printers.....	1/00-5/00
Common to cameras only	
exposure, control thereof.....	7/00, 9/00
viewfinders, focusing aids.....	13/00
filters; constructional details, accessories.....	11/00, 17/00
special procedures for taking photographs.....	15/00
Common to projectors only.....	21/00, 23/00
Common to printers only.....	27/00

## APPARATUS

Cameras.....	19/00
Projectors, viewers; devices for changing pictures.....	21/00, 25/00, 23/00
Printing apparatus.....	27/00
Combinations with other apparatus.....	29/00

## SPECIAL TECHNIQUES

Associated working with sound apparatus.....	31/00
Colour photography; stereoscopic photography; panoramic photography; high-speed photography.....	33/00, 35/00, 37/00, 39/00
Other techniques.....	41/00
Using waves other than optical waves, visualisation.....	42/00
TESTING.....	43/00

**Details common to at least two of the following types of apparatus: cameras, projectors, printers****1/00 Film-strip handling of general interest for cameras, projectors or printers**

- 1/02 • Moving film strip by pull on end thereof
- 1/04 • • Pull exerted by take-up spool
- 1/06 • • • rotated by lever-operated ratchet and pawl
- 1/08 • • • rotated by band, chain, rack, or other linear reciprocating operation
- 1/10 • • • rotated by knob through gearing
- 1/12 • • • rotated by motor, e.g. spring
- 1/14 • • Special arrangements to ensure constant length of movement of film
- 1/16 • • • by film-arresting pins
- 1/18 • Moving film strip by means which act on the film between the ends thereof
- 1/20 • • Acting means
- 1/22 • • • Claws or pins engaging holes in the film
- 1/24 • • • Sprockets engaging holes in the film
- 1/26 • • • Spiked wheels or pins not penetrating the film
- 1/28 • • • Shuttle feed
- 1/30 • • • Belt feed
- 1/32 • • • Friction grippers or rollers
- 1/34 • • • Beaters
- 1/36 • • • Pneumatic acting means
- 1/38 • • embodying Geneva motion, e.g. Maltese-cross gearing
- 1/40 • embodying frictional coupling or clutches
- 1/42 • Guiding, framing, or constraining film in desired position relative to lens system
- 1/44 • • Guides engaging edge of film (gates G03B 1/48)
- 1/46 • • Rollers engaging face of film, e.g. barrel, waisted, conical (gates G03B 1/48)
- 1/48 • • Gates or pressure devices, e.g. plate

- 1/50 • • • adjustable or interchangeable, e.g. for different film widths
- 1/52 • • • Pneumatic pressure devices
- 1/54 • • Tensioning or loop-maintaining devices
- 1/56 • Threading; Loop forming
- 1/58 • • automatic
- 1/60 • Measuring or indicating length of the used or unused film; Counting number of exposures (measuring length in general G01B)
- 1/62 • • involving locking or stop-motion devices
- 1/64 • • by means which ascertain the radius of the film coiled on a spool
- 1/66 • • Counting number of exposures (counting mechanisms per se G06M)
- 3/00 Focusing arrangements of general interest for cameras, projectors or printers** (focusing means, autofocus systems for cameras G03B 13/00; means for automatic focusing of projectors G03B 21/53; means for automatic focusing of projection-printing apparatus or copying cameras G03B 27/34, G03F)
- 3/02 • moving lens along baseboard
- 3/04 • adjusting position of image plane without moving lens
- 3/06 • • using movable reflectors to alter length of light-path
- 3/10 • Power-operated focusing
- 3/12 • • adapted for remote control (control systems in general G05)
- 5/00 Adjustment of optical system relative to image or object surface other than for focusing of general interest for cameras, projectors or printers**
- 5/02 • Lateral adjustment of lens
- 5/04 • Vertical adjustment of lens; Rising fronts
- 5/06 • Swinging lens about normal to the optical axis
- 5/08 • Swing backs

Details common to cameras

**7/00** *Control of exposure by setting shutters, diaphragms or filters, separately or conjointly (control of exposure in television cameras by means of circuitry for compensating for variation in the brightness of the object H04N 5/235) [1, 2014.01]*

- 7/01 • with selection of either manual or automatic mode [2014.01]
- 7/02 • Control effected by setting a graduated member on the camera in accordance with indication or reading afforded by a light meter, which may be either separate from, or built into, camera body
- 7/04 • Control effected by hand adjustment of a member that senses indication of a pointer of a built-in light-sensitive device, e.g. by restoring pointer to a fixed associated reference mark
- 7/06 • • by a follow-up movement of an associated reference mark to the pointer
- 7/08 • *Control effected solely on the basis of the response, to the intensity of the light received by the camera, of a built-in light-sensitive device [1, 2014.01]*
- 7/0805 • • *Setting of priority modes [2014.01]*
- 7/081 • • Analogue circuits [3]
- 7/083 • • • for control of exposure time [3]
- 7/085 • • • for control of aperture [3]
- 7/087 • • • for control of both exposure time and aperture [3]
- 7/089 • • • for storage of exposure value in mirror reflex cameras [3]
- 7/091 • • Digital circuits [3]
- 7/093 • • • for control of exposure time [3]
- 7/095 • • • for control of aperture [3]
- 7/097 • • • for control of both exposure time and aperture [3]
- 7/099 • • *Arrangement of photoelectric elements in or on the camera [3, 2014.01]*
- 7/0993 • • • *in the camera [2014.01]*
- 7/0997 • • • *Through the lens [TTL] measuring [2014.01]*
- 7/10 • • a servo-motor providing energy to move the setting member
- 7/12 • • a hand-actuated member moved from one position to another providing the energy to move the setting member, e.g. depression of shutter release button causes a stepped feeler to co-operate with the pointer of the light-sensitive device to set the diaphragm and thereafter release the shutter
- 7/14 • • • setting of both shutter and diaphragm aperture being effected so as to give the optimum compromise between depth of field and shortness of exposure
- 7/16 • *in accordance with both the intensity of the flash source and the distance of the flash source from the object, e.g. in accordance with the "guide number" of the flash bulb and the focusing of the camera [1, 2014.01]*
- 7/17 • • *Selection of modes in flash units by exposure control arrangements [2014.01]*
- 7/18 • in accordance with light-reducing "factor" of filter or other obturator used with or on the lens of the camera
- 7/20 • in accordance with change of lens
- 7/22 • in accordance with temperature or height, e.g. in aircraft
- 7/24 • automatically in accordance with markings or other means indicating film speed or kind of film on the magazine to be inserted in the camera [3]

- 7/26 • Power supplies; Circuitry or arrangement to switch on the power source; Circuitry to check the power source voltage [3]
- 7/28 • Circuitry to measure or to take account of the object contrast [3]
- 7/30 • *Safety arrangements for control of exposure [2014.01]*

**9/00 Exposure-making shutters; Diaphragms**

- 9/02 • Diaphragms [2]
- 9/04 • • Single movable plate with two or more apertures of graded size, e.g. sliding plate, pivoting plate
- 9/06 • • Two or more co-operating pivoted blades e.g. iris type (shutters functioning as diaphragms by limiting extent of opening movement G03B 9/08)
- 9/07 • • with means for presetting the diaphragm
- 9/08 • Shutters (electro-, magneto-, or acousto-optical shutters G02F 1/00) [2]
- 9/10 • • Blade or disc rotating or pivoting about axis normal to its plane
- 9/12 • • • Two relatively-adjustable aperture-defining members moving as a unit
- 9/14 • • • Two separate members moving in opposite directions
- 9/16 • • • Two separate members moving in the same direction
- 9/18 • • • More than two members
- 9/20 • • • • each moving in a single direction first to open and then to reclose
- 9/22 • • • • each moving in one direction to open and then in opposite direction to close, e.g. iris type
- 9/24 • • • Adjusting size of aperture formed by members when fully open so as to constitute a virtual diaphragm that is adjustable
- 9/26 • • • incorporating cover blade or blades
- 9/28 • • Roller blind or flexible plate
- 9/30 • • • Single blind with multiple slots or other aperture
- 9/32 • • • Double blind
- 9/34 • • • • with adjustable slot; with mechanism controlling relative movement of blinds to form slot
- 9/36 • • Sliding rigid plate
- 9/38 • • • Single rigid plate with multiple slots or other apertures
- 9/40 • • • Double plate
- 9/42 • • • • with adjustable slot; with mechanism controlling relative movement of plates to form slot
- 9/44 • • • Curved track and plate
- 9/46 • • Flap shutters pivoting about axis in plane of flap
- 9/48 • • • Double flap
- 9/50 • • • Louvre type
- 9/52 • • Barrel shutters
- 9/54 • • Conical shutters; Rotating plate with axis of rotation inclined to optical axis of shutter
- 9/58 • Means for varying duration of "open" period of shutter
- 9/60 • • by varying speed of movement of obturating members
- 9/62 • • by varying interval of time between end of opening movement and beginning of closing movement
- 9/64 • Mechanism for delaying opening of shutter (separate from shutter G03B 17/38)

9/66	• Means for cocking shutter separate from means for releasing shutter	15/16	• for photographing the track of moving objects (high-speed photography G03B 39/00; recording tracks of nuclear particles G01T 5/00)
9/68	• • Cocking effected by movement of film		
9/70	• with flash-synchronising contacts		
<b>11/00</b>	<b>Filters or other obturators specially adapted for photographic purposes</b> (filters <i>per se</i> G02B)	<b>17/00</b>	<b>Details of cameras or camera bodies; Accessories therefor</b> (lens hoods or caps G03B 11/04)
11/02	• Sky masks	17/02	• Bodies
11/04	• Hoods or caps for eliminating unwanted light from lenses, viewfinders, or focusing aids	17/04	• • collapsible, foldable, or extensible, e.g. book type (bellows for instruments in general G12B)
11/06	• • Lens caps for exposure making	17/06	• • with exposure meters or other indicators built into body but not connected to other camera members
<b>13/00</b>	<b>Viewfinders; Focusing aids for cameras; Means for focusing for cameras; Autofocus systems for cameras</b> (hoods, caps G03B 11/04; reflex camera arrangements G03B 19/12, G03B 19/14; rangefinders <i>per se</i> G01C 3/00; automatic focusing in general G02B 7/09; systems for automatic generation of focusing signals G02B 7/28) [5]	17/08	• • Waterproof bodies or housings
13/02	• Viewfinders	17/10	• • Soundproof bodies
13/04	• • of direct-vision type, e.g. frame, sighting mark	17/12	• • with means for supporting objectives, supplementary lenses, filters, masks, or turrets
13/06	• • with lenses with or without reflectors	17/14	• • • interchangeably
13/08	• • • with reflected image of frame	17/16	• • for containing both motion-picture camera and still-picture camera
13/10	• • adjusting viewfinder field	17/17	• • with reflectors arranged in beam forming the photographic image, e.g. for reducing dimensions of camera
13/12	• • • to compensate for change of camera lens or size of picture	17/18	• Signals indicating condition of a camera member or suitability of light (indicating depth of field G03B 13/30)
13/14	• • • to compensate for parallax due to short range	17/20	• • visible in viewfinder
13/16	• • combined with focusing aids	17/22	• with means for cutting-off film
13/18	• Focusing aids	17/24	• with means for separately producing marks on the film, e.g. title, time of exposure
13/20	• • Rangefinders coupled with focusing arrangements, e.g. adjustment of rangefinder automatically focusing camera	17/26	• Holders for containing light-sensitive material and adapted to be inserted within the camera (holders for X-ray films G03B 42/04) [2]
13/22	• • • coupling providing for compensation upon change of camera lens	17/28	• Locating light-sensitive material within camera
13/24	• • Focusing screens	17/30	• • Locating spools or other rotatable holders of coiled film
13/26	• • • with magnifiers for inspecting image formed on screen	17/32	• • Locating plates or cut films
13/28	• • • Image-splitting devices	17/34	• • • Changing plates or cut films
13/30	• • indicating depth of field [5]	17/36	• Counting number of exposures (of film strips G03B 1/66; counting mechanisms in general G06M)
13/32	• Means for focusing [5]	17/38	• Releasing-devices separate from shutter (integral with shutter G03B 9/08)
13/34	• • Power focusing [5]	17/40	• • with delayed or timed action
13/36	• • • Autofocus systems [5]	17/42	• Interlocking between shutter operation and advance of film or change of plate or cut-film
<b>15/00</b>	<b>Special procedures for taking photographs; Apparatus therefor</b>	17/44	• Means for exchanging focusing screen and light-sensitive material
15/02	• Illuminating scene	17/46	• Means for exposing single frames in motion-picture camera
15/03	• • Combinations of cameras with lighting apparatus; Flash units	17/48	• adapted for combination with other photographic or optical apparatus (with microscopes, with telescopes G02B)
15/035	• • • Combinations of cameras with incandescent lamps	17/50	• • with both developing and finishing apparatus (processing apparatus G03D)
15/04	• • • Combinations of cameras with non-electronic flash apparatus; Non-electronic flash units (light sources using a charge of combustible material F21K 5/00; ignition circuits H05B 43/02)	17/52	• • • of the Land type
15/05	• • • Combinations of cameras with electronic flash apparatus; Electronic flash units (discharge lamps <i>per se</i> H01J; circuit arrangements H05B 41/00)	17/53	• • • for automatically delivering a finished picture after a signal causing exposure has been given, e.g. by pushing a button, by inserting a coin
15/06	• • Special arrangements of screening, diffusing, or reflecting devices, e.g. in studio	17/54	• • with projector
15/07	• • • Arrangements of lamps in studios	17/55	• with provision for heating or cooling, e.g. in aircraft
15/08	• Trick photography	17/56	• Accessories (carrying-cases A45C)
15/10	• • using back-projection, i.e. blending artificial background with real foreground	17/58	• • Attachments for converting cameras into reflex cameras
15/12	• • using mirrors		
15/14	• for taking photographs during medical operations		
		<b>19/00</b>	<b>Cameras</b> (details G03B 17/00)
		19/02	• Still-picture cameras
		19/04	• • Roll-film cameras

- 19/06 • • • adapted to be loaded with more than one film, e.g. with exposure of one or the other at will (G03B 19/07 takes precedence)
- 19/07 • • • having more than one objective
- 19/08 • • • with provision for alternative use with plates or cut-films
- 19/10 • • Plate or cut-film cameras (with provision for alternative use with roll film G03B 19/08)
- 19/12 • • Reflex cameras with single objective and a movable reflector or a partly-transmitting mirror
- 19/14 • • with paired lenses, one of which forms image on photographic material and the other forms a corresponding image on a focusing screen
- 19/16 • • Pin-hole cameras
- 19/18 • Motion-picture cameras (with non-intermittently running film G03B 41/02)
- 19/20 • • Reflex cameras
- 19/22 • • Double cameras
- 19/24 • • adapted to be loaded with more than one film, e.g. with exposure of one or the other at will
- 19/26 • • with fade-in and fade-out effects [4]

**21/00 Projectors or projection-type viewers; Accessories therefor** (devices for changing pictures G03B 23/00; zoetropes G03B 25/00; photographic printing apparatus G03B 27/00; devices or systems producing a varying lighting effect F21S 10/00; optical projection comparators G01B 9/08; projection microscopes G02B 21/36)

- 21/02 • Multiple-film apparatus
- 21/04 • • Picture "juke-boxes"
- 21/06 • affording only episcopic projection
- 21/08 • affording epidiascopic projection
- 21/10 • Projectors with built-in or built-on screen (projection screens in general G03B 21/56)
- 21/11 • • for microfilm reading
- 21/12 • adapted for projection of either still pictures or motion pictures (prolonged exhibition of single frame G03B 21/38)
- 21/13 • Projectors for producing special effects at the edges of picture, e.g. blurring
- 21/132 • Overhead projectors, i.e. capable of projecting hand-writing or drawing during action (epidiascopic projectors G03B 21/08)
- 21/134 • Projectors combined with typing apparatus or with printing apparatus
- 21/14 • Details
- 21/16 • • Cooling; Preventing overheating
- 21/18 • • Fire preventing or extinguishing
- 21/20 • • Lamp housings (condensers *per se* G02B)
- 21/22 • • Soundproof bodies
- 21/26 • • Projecting separately subsidiary matter simultaneously with main image (light pointers G02B 27/20)
- 21/28 • • Reflectors in projection beam
- 21/30 • • adapted to collapse or fold, e.g. for portability
- 21/32 • • Details specially adapted for motion-picture projection (with film moving continuously through the gate G03B 41/02)
- 21/34 • • • Change-over arrangements
- 21/36 • • • • Fades, dissolves, or wipes
- 21/38 • • • Prolonged exhibition of single frame
- 21/40 • • • Eliminating or reducing effect of flicker
- 21/42 • • • Preventing damage to film due to abnormal operation of projector
- 21/43 • • • Driving mechanisms

- 21/44 • • • • Mechanisms transmitting motion to film-strip feed; Mechanical linking of shutter and intermittent feed (film-strip feed *per se* G03B 1/00)
- 21/46 • • • • • affording adjustment for framing
- 21/48 • • • • • for altering frame speed; for regulating constancy of film speed
- 21/50 • • • Control devices operated by the film strip during the run (controlling or regulating speed G03B 21/48)
- 21/52 • • • • by prepared film
- 21/53 • • Means for automatic focusing, e.g. to compensate thermal effects (automatic focusing in general G02B 7/09; systems for automatic generation of focusing signals G02B 7/28) [5]
- 21/54 • Accessories
- 21/56 • • Projection screens
- 21/58 • • • collapsible, e.g. foldable; of variable area [1, 2014.01]
- 21/585 • • • • Inflatable screens [2014.01]
- 21/60 • • • characterised by the nature of the surface [1, 2014.01]
- 21/602 • • • • Lenticular screens (G03B 21/625 takes precedence) [2014.01]
- 21/604 • • • • • Polarised screens [2014.01]
- 21/606 • • • • • for relief projection [2014.01]
- 21/608 • • • • • Fluid screens [2014.01]
- 21/62 • • • • • Translucent screens [1, 2014.01]
- 21/625 • • • • • Lenticular translucent screens [2014.01]
- 21/64 • • Means for mounting individual pictures to be projected, e.g. frame for transparency

**23/00 Devices for changing pictures in viewing apparatus or projectors** (film-strip handling G03B 1/00; direct viewers G02B)

#### **Note(s)**

In this group, the following term is used with the meaning indicated:

- "picture" means any flat representation, whether transparent or not, e.g. produced by photography, writing, or printing.
- 23/02 • in which a picture is removed from a stock and returned to the same stock or another one; Magazines therefor
- 23/04 • • with linear movement
- 23/06 • • with rotary movement
- 23/08 • in which pictures are attached to a movable carrier
- 23/10 • • drum or disc carrier
- 23/12 • • linear strip carrier
- 23/14 • Carriers operable to move pictures into, and out of, the projection or viewing position and carrying one or two pictures only in a removable manner (G03B 23/18 takes precedence) [4]
- 23/18 • with fade-in and fade-out effects [4]
- 25/00 Viewers, other than projection viewers, giving motion-picture effects by persistence of vision, e.g. zoetrope** (high-speed photography G03B 39/00)
- 25/02 • with interposed lenticular or line screen

**27/00 Photographic printing apparatus** (film-strip handling G03B 1/00)

- 27/02 • Exposure apparatus for contact printing
- 27/04 • • Copying apparatus without a relative movement between the original and the light source during exposure, e.g. printing frame, printing box

- 27/06 • • • for automatic repeated copying of the same original
  - 27/08 • • • for automatic copying of several originals one after the other, e.g. for copying cinematograph film
  - 27/10 • • Copying apparatus with a relative movement between the original and the light source during exposure
  - 27/12 • • • for automatic repeated copying of the same original
  - 27/14 • • Details
  - 27/16 • • • Illumination arrangements, e.g. positioning of lamps, positioning of reflectors (controlling the exposure G03B 27/72)
  - 27/18 • • • Maintaining or producing contact pressure between original and light-sensitive material
  - 27/20 • • • • by using a vacuum or fluid pressure
  - 27/22 • • • • by stretching over a curved surface
  - 27/24 • • • Separating the original from the print
  - 27/26 • • • Cooling
  - 27/28 • • • Edge-masking devices
  - 27/30 • • • adapted to be combined with processing apparatus (processing apparatus *per se* G03D)
  - 27/32 • Projection printing apparatus, e.g. enlarger, copying camera
  - 27/34 • • Means for automatic focusing therefor (systems for automatic generation of focusing signals G02B 7/28; means for automatic focusing for photomechanical production G03F 7/207) [4]
  - 27/36 • • • by mechanical connections, e.g. by cam, by linkage
  - 27/38 • • • • embodying screws with non-uniform pitch
  - 27/40 • • • • adapted for use with lenses of different focal length
  - 27/42 • • for automatic sequential copying of the same original (G03B 27/34, G03B 27/53 take precedence) [4]
  - 27/44 • • for multiple copying of the same original at the same time (G03B 27/34, G03B 27/53 take precedence) [4]
  - 27/46 • • for automatic sequential copying of different originals, e.g. enlargers, roll film printers (G03B 27/34, G03B 27/50, G03B 27/53 take precedence) [4]
  - 27/465 • • • at different positions of the same strip, e.g. microfilm [4]
  - 27/47 • • • at different positions of the same sheet, e.g. microfiche [4]
  - 27/475 • • • copying cinematographic film (G03B 27/48 takes precedence) [4]
  - 27/48 • • • with original in the form of a film strip moving continuously and compensation for consequent image movement
  - 27/50 • • with slit or like diaphragm moving over original for progressive exposure (G03B 27/34 takes precedence) [4]
  - 27/52 • • Details
  - 27/53 • • • Automatic registration or positioning of originals with respect to each other or the photosensitive layer (within photo-mechanical production of textured or patterned surfaces, e.g. of integrated circuits, G03F 9/00) [4]
  - 27/54 • • • Lamp housings; Illuminating means (controlling the exposure G03B 27/72)
  - 27/56 • • • Mounting enlarger head on column
  - 27/58 • • • Baseboards, masking frames, or other holders for the sensitive material (G03B 27/53 takes precedence) [4]
  - 27/60 • • • • using a vacuum or fluid pressure
  - 27/62 • • • Holders for the original (G03B 27/53 takes precedence) [4]
  - 27/64 • • • • using a vacuum or fluid pressure
  - 27/66 • • • specially adapted for holding half-tone screens
  - 27/68 • • • Introducing or correcting distortion, e.g. in connection with oblique projection
  - 27/70 • • • Reflectors in printing beam
  - 27/72 • Controlling or varying light intensity, spectral composition, or exposure time in photographic printing apparatus (exposure meters *per se* G01J; control of light intensity in general G05D 25/00)
  - 27/73 • • Controlling exposure by variation of spectral composition, e.g. multicolor printers [3]
  - 27/74 • • Positioning exposure meters in the apparatus
  - 27/80 • • in dependence upon automatic analysis of the original (G03B 27/73 takes precedence) [3]
  - 29/00 Combinations of cameras, projectors, or photographic printing apparatus with non-photographic non-optical apparatus, e.g. clocks, weapons; Cameras having the shape of other objects** (combinations with flash apparatus G03B 15/03; combinations with instruments for medical examination of cavities or tubes of the body A61B 1/04; arrangements specially adapted for eye photography A61B 3/14; combinations with surveying instruments G01C; combinations with core or moderator structure of nuclear reactors G21C 17/08; structural combinations with electric discharge tubes H01J 5/16, H01J 29/89, H01J 37/22)
- Special techniques**
- 31/00 Associated working of cameras or projectors with sound-recording or -reproducing means** (record carriers characterised by the selection of the material and comprising cinematographic film and magnetic track G11B 5/633)
  - 31/02 • in which sound track is on a moving-picture film
  - 31/04 • in which sound track is not on, but is synchronised with, a moving-picture film
  - 31/06 • in which sound track is associated with successively-shown still pictures
  - 31/08 • with fade-in and fade-out effects [4]
  - 33/00 Colour photography, other than mere exposure or projection of a colour film** (printing apparatus G03B 27/00; stereoscopic colour photography G03B 35/00)
  - 33/02 • by two-colour separation records, e.g. red-aspect and white complete records; using Land effect
  - 33/04 • by four or more separation records
  - 33/06 • by additive-colour projection apparatus
  - 33/08 • Sequential recording or projection (G03B 33/02, G03B 33/04, G03B 33/06 take precedence)
  - 33/10 • Simultaneous recording or projection (G03B 33/02, G03B 33/04, G03B 33/06 take precedence)
  - 33/12 • • using beam-splitting or beam-combining systems, e.g. dichroic mirrors
  - 33/14 • • using lenticular screens (integral with film G03C)
  - 33/16 • • using colour-pattern screens (integral with film G03C)

## G03B

- 35/00 Stereoscopic photography** (panoramic or wide-screen systems G03B 37/00; photogrammetry G01C)
- 35/02 • by sequential recording
  - 35/04 • • with movement of beam-selecting members in a system defining two or more viewpoints
  - 35/06 • • with axial movement of lens or gate between exposures
  - 35/08 • by simultaneous recording
  - 35/10 • • having single camera with stereoscopic-base-defining system
  - 35/12 • • involving recording of different viewpoint images in different colours on a colour film
  - 35/14 • Printing apparatus specially adapted for conversion between different types of record (G03B 42/08 takes precedence) **[4]**
  - 35/16 • by sequential viewing
  - 35/18 • by simultaneous viewing
  - 35/20 • • using two or more projectors
  - 35/22 • • using single projector with stereoscopic-base-defining system
  - 35/24 • • using apertured or refractive resolving means on screen or between screen and eye
  - 35/26 • • using polarised or coloured light for separating different viewpoint images
- 37/00 Panoramic or wide-screen photography; Photographing extended surfaces, e.g. for surveying; Photographing internal surfaces, e.g. of pipe**
- 37/02 • with scanning movement of lens or camera
  - 37/04 • with cameras or projectors providing touching or overlapping fields of view
  - 37/06 • involving anamorphosis (G03B 37/02, G03B 37/04 take precedence)
- 39/00 High-speed photography**
- 39/02 • using stationary plate or film (G03B 39/06 takes precedence)

- 39/04 • using moving plate or film (G03B 39/06 takes precedence)
  - 39/06 • using light-guides for transferring image frame or elements thereof into different array, e.g. into a line
- 41/00 Special photographic techniques not covered by groups G03B 31/00-G03B 39/00; Apparatus therefor [2]**
- 41/02 • using non-intermittently-running film
  - 41/04 • • with optical compensator
  - 41/06 • • • with rotating reflecting member
  - 41/08 • • • with rotating transmitting member
  - 41/10 • • • with oscillating reflecting member
  - 41/12 • • • with oscillating transmitting member
  - 41/14 • • Overcoming image movement by brief flashes of light
- 42/00 Obtaining records using waves other than optical waves; Visualisation of such records by using optical means** (investigating or analysing materials using electromagnetic or sonic waves G01N; using radar, sonar or analogous techniques G01S) **[4]**
- 42/02 • using X-rays (measurement of X-radiation G01T; X-ray apparatus, circuits therefor H05G 1/00) **[4]**
  - 42/04 • • Holders for X-ray films **[4]**
  - 42/06 • using ultrasonic, sonic or infrasonic waves (measurement of ultrasonic, sonic or infrasonic waves G01H) **[4]**
  - 42/08 • Visualisation of records by optical means (optical systems using spatial filters G02B 27/46; optics for phase object visualisation G02B 27/50) **[4]**
- 
- 43/00 Testing correct operation of photographic apparatus or parts thereof** (measuring specific variables G01)
- 43/02 • Testing shutters (measuring time intervals G04F)

## G03C PHOTSENSITIVE MATERIALS FOR PHOTOGRAPHIC PURPOSES; PHOTOGRAPHIC PROCESSES, e.g. CINE, X-RAY, COLOUR OR STEREO-PHOTOGRAPHIC PROCESSES; AUXILIARY PROCESSES IN PHOTOGRAPHY (photographic processes characterised by the use or manipulation of apparatus classifiable per se in subclass G03B, see G03B)

### Note(s)

In this subclass, the following expressions are used with the meanings indicated:

- "photosensitive compositions" covers photosensitive substances, e.g. silver halides, and, if applicable, binders or additives;
- "photosensitive materials" covers the photosensitive compositions, e.g. emulsions, the bases carrying them, and, if applicable, auxiliary layers.

### Subclass index

#### PHOTOGRAPHIC PROCESSES

General.....	5/00, 11/00
For colour photography.....	7/00
For diffusion transfer processes.....	8/00
For stereo-photography and the like.....	9/00

#### PHOTSENSITIVE COMPOSITIONS AND MATERIALS..... 1/00

#### PACKAGING..... 3/00

- 1/00 Photosensitive materials** (photosensitive materials for multicolour processes G03C 7/00; for diffusion transfer processes G03C 8/00) **[5]**

- 1/005 • Silver halide emulsions; Preparation thereof; Physical treatment thereof; Incorporation of additives therein (catalytic amounts of silver halide in dry silver systems G03C 1/498) **[5]**
- 1/015 • • Apparatus or processes for the preparation of emulsions (coating, drying G03C 1/74) **[5]**

- 1/025 • • Physical treatment of emulsions, e.g. by ultrasonics, refrigeration, pressure (coating, drying G03C 1/74) [5]
- 1/035 • • characterised by the crystal form or composition, e.g. mixed grain [5]
- 1/04 • • with macromolecular additives; with layer-forming substances [5]
- 1/043 • • • Polyalkylene oxides; Polyalkylene sulfides; Polyalkylene selenides; Polyalkylene tellurides [5]
- 1/047 • • • Proteins, e.g. gelatine derivatives; Hydrolysis or extraction products of proteins [5]
- 1/053 • • • Polymers obtained by reactions only involving carbon-to-carbon unsaturated bonds, e.g. vinyl polymers [5]
- 1/06 • • with non-macromolecular additives (G03C 1/04 takes precedence) [5]
- 1/07 • • • Substances influencing grain growth during silver salt formation [5]
- 1/08 • • • Sensitivity-increasing substances [5]
- 1/09 • • • • Noble metals or mercury; Salts or compounds thereof; Sulfur, selenium or tellurium, or compounds thereof, e.g. for chemical sensitising (G03C 1/34, G03C 1/35 take precedence) [5]
- 1/10 • • • • Organic substances
- 1/12 • • • • • Methine or polymethine dyes
- 1/14 • • • • • • with an odd number of CH groups
- 1/16 • • • • • • • with one CH group
- 1/18 • • • • • • • with three CH groups
- 1/20 • • • • • • • with more than three CH groups
- 1/22 • • • • • • • with an even number of CH groups
- 1/24 • • • • • • Styryl dyes
- 1/26 • • • • • • Polymethine chain forming part of a heterocyclic ring
- 1/28 • • • • together with supersensitising substances
- 1/29 • • • • • the supersensitising mixture being solely composed of dyes [5]
- 1/295 • • • Development accelerators [5]
- 1/30 • • • Hardeners
- 1/31 • • • Plasticisers [2]
- 1/32 • • • Matting agents
- 1/33 • • • Spot-preventing agents [2]
- 1/34 • • • Fog-inhibitors; Stabilisers; Agents inhibiting latent image regression [5]
- 1/35 • • • Antiplumming agents, i.e. antibronzing agents; Toners [2, 5]
- 1/36 • • • Desensitisers (direct positive emulsions G03C 1/485) [5]
- 1/37 • • • Antiseptic agents [2]
- 1/38 • • • Dispersants; Agents facilitating spreading [5]
- 1/40 • • • Dyestuffs not covered by groups G03C 1/08-G03C 1/38 or G03C 1/42 [5]
- 1/42 • • • Developers or their precursors [5]
- 1/43 • • • Processing agents or their precursors, not covered by groups G03C 1/07-G03C 1/42 [5]
- 1/46 • • having more than one photosensitive layer
- 1/485 • • Direct positive emulsions [2, 5]
- 1/49 • • Print-out and photodevelopable emulsions [2, 5]
- 1/492 • • Photosoluble emulsions [5]
- 1/494 • Silver salt compositions other than silver halide emulsions; Photothermographic systems [5]
- 1/496 • • Binder-free compositions, e.g. evaporated [5]
- 1/498 • • Photothermographic systems, e.g. dry silver [5]
- 1/50 • Compositions containing noble metal salts other than silver salts, as photosensitive substances [5]
- 1/52 • Compositions containing diazo compounds as photosensitive substances (G03C 1/64 takes precedence) [5]
- 1/54 • • Diazonium salts or diazo anhydrides
- 1/56 • • Diazo sulfonates
- 1/58 • • Coupling substances therefor [5]
- 1/60 • • with macromolecular additives [5]
- 1/61 • • with non-macromolecular additives [5]
- 1/62 • • • Metal compounds reducible to metal
- 1/64 • Compositions containing iron compounds as photosensitive substances [5]
- 1/66 • Compositions containing chromates as photosensitive substances [5]
- 1/67 • Compositions containing cobalt compounds as photosensitive substances [5]
- 1/675 • Compositions containing polyhalogenated compounds as photosensitive substances [5]
- 1/685 • Compositions containing spiro-condensed pyran compounds or derivatives thereof, as photosensitive substances [5]
- 1/695 • Compositions containing azides as photosensitive substances [5]
- 1/705 • Compositions containing chalcogenides, metals or alloys thereof, as photosensitive substances, e.g. photodope systems [5]
- 1/72 • Photosensitive compositions not covered by groups G03C 1/005-G03C 1/705 [5]
- 1/725 • • containing inorganic compounds [5]
- 1/73 • • containing organic compounds [5]
- 1/735 • • • Organo-metallic compounds [5]
- 1/74 • Applying photosensitive compositions to the base; Drying processes therefor (G03C 1/496 takes precedence) [2, 5]
- 1/76 • Photosensitive materials characterised by the base or auxiliary layers [5]
- 1/765 • • characterised by the shape of the base, e.g. arrangement of perforations, jags [5]
- 1/77 • • the base being of metal [5]
- 1/775 • • the base being of paper [5]
- 1/785 • • • translucent [5]
- 1/79 • • • Macromolecular coatings or impregnations therefor, e.g. varnishes [5]
- 1/795 • • the base being formed of macromolecular substances (G03C 1/775 takes precedence) [5]
- 1/805 • • characterised by stripping layers or stripping means [5]
- 1/81 • • characterised by anti-coiling means [5]
- 1/815 • • characterised by means for filtering or absorbing ultra-violet light, e.g. optical bleaching agents (for photoprinting G03C 5/10; for intensifying X-ray images G03C 5/17) [5]
- 1/825 • • characterised by antireflecting means or visible-light filtering means, e.g. anti-halation [5]
- 1/83 • • • Organic dyestuffs therefor [5]
- 1/835 • • • Macromolecular substances therefor, e.g. mordants [5]
- 1/85 • • characterised by antistatic additives or coatings [5]
- 1/89 • • • Macromolecular substances therefor [5]
- 1/91 • • characterised by subbing layers or subbing means [5]
- 1/93 • • • Macromolecular substances therefor [5]
- 1/95 • • rendered opaque or writable, e.g. with inert particulate additives (G03C 1/775 takes precedence) [5]

**3/00 Packages of films for inserting into cameras, e.g. roll-films or film-packs; Wrapping materials for light-sensitive plates, films, or papers, e.g. materials characterised by the use of special dyes, printing inks or adhesives**

3/02 • Photographic roll-films with paper strips

**5/00 Photographic processes or agents therefor; Regeneration of such processing agents** (multicolour processes G03C 7/00; diffusion transfer processes G03C 8/00; stereo-photographic processes G03C 9/00) [4, 5]

5/02 • Sensitometric processes, e.g. determining sensitivity, colour sensitivity, gradation, graininess, density; Making sensitometric wedges

5/04 • Photo-taking processes

5/06 • • Travelling-mask processes

5/08 • Photoprinting (G03C 5/18 takes precedence); Processes or means for preventing photoprinting [3, 5]

5/10 • • Reflex-printing; Photoprinting using fluorescent or phosphorescent means [5]

5/12 • Cinematographic processes of taking pictures or printing

5/14 • • combined with sound-recording

5/16 • X-ray, infra-red, or ultra-violet ray processes

5/17 • • using screens to intensify X-ray images [2, 4]

5/18 • Diazo-type processes, e.g. thermal development, or agents therefor [3, 5]

5/20 • • Reflex-printing

5/22 • Direct chromate processes, i.e. without preceding silver picture, or agents therefor [5]

5/26 • Processes using silver-salt-containing photosensitive materials or agents therefor (physical development G03C 5/58) [5]

5/28 • • Cinematographic-film processes [5]

5/29 • • Development processes or agents therefor (G03C 5/38, G03C 5/50 take precedence) [5]

5/30 • • • Developers

5/305 • • • Additives other than developers [5]

5/31 • • • Regeneration; Replenishers [5]

5/315 • • • Tanning development [5]

5/32 • • Latensification; Desensitising [5]

5/38 • • Fixing; Developing-fixing; Hardening-fixing (bleach-fixing G03C 5/44) [5]

5/39 • • • Stabilising, i.e. fixing without washing out [2, 5]

5/395 • • Regeneration of photographic processing agents other than developers; Replenishers therefor [4, 5]

5/40 • • Chemically transforming developed images (G03C 5/50 takes precedence) [5]

5/42 • • • Reducing; Intensifying [5]

5/44 • • • Bleaching; Bleach-fixing [5]

5/46 • • • Toning [5]

5/48 • • • Mordanting [5]

5/50 • • Reversal development; Contact processes (G03C 5/315, G03C 8/00 take precedence) [5]

5/56 • Processes using photosensitive compositions covered by groups G03C 1/64-G03C 1/72 or agents therefor (G03C 5/58 takes precedence) [5]

5/58 • Processes for obtaining metallic images by vapour deposition or physical development [5]

5/60 • Processes for obtaining vesicular images [5]

**7/00 Multicolour photographic processes or agents therefor; Regeneration of such processing agents; Photosensitive materials for multicolour processes** (diffusion transfer processes G03C 8/00) [4, 5]

7/02 • Direct bleach-out processes; Materials therefor; Preparing or processing such materials [5]

7/04 • Additive processes using colour screens; Materials therefor; Preparing or processing such materials [5]

7/06 • • Manufacture of colour screens

7/08 • • • from diversely-coloured grains irregularly distributed

7/10 • • • with regular areas of colour, e.g. bands, lines, dots

7/12 • • • • by photo-exposure

7/14 • Additive processes using lenticular screens; Materials therefor; Preparing or processing such materials [5]

7/18 • Processes for the correction of the colour image in subtractive colour photography (using coloured colour-couplers G03C 7/333) [5]

7/20 • Subtractive colour processes using differently sensitised films, each coated on its own base, e.g. bipacks, tripacks [5]

7/22 • Subtractive cinematographic processes; Materials therefor; Preparing or processing such materials [5]

7/24 • • combined with sound-recording

7/25 • • Dye-imbibition processes; Materials therefor; Preparing or processing such materials [5]

7/26 • Silver halide emulsions for subtractive colour processes (G03C 7/28-G03C 7/30 take precedence) [5]

7/28 • Silver dye bleach processes; Materials therefor; Preparing or processing such materials [5]

7/29 • • Azo dyes therefor [5]

7/30 • Colour processes using colour-coupling substances; Materials therefor; Preparing or processing such materials [5]

7/305 • • Substances liberating photographically active agents, e.g. development-inhibiting releasing couplers (G03C 7/388 takes precedence) [5]

7/32 • • Colour-coupling substances (G03C 7/305, G03C 7/388 take precedence) [5]

7/327 • • • Macromolecular coupling substances [5]

7/333 • • • Coloured coupling substances, e.g. for the correction of the coloured image [5]

7/34 • • • Couplers containing phenols (G03C 7/327, G03C 7/333 take precedence) [5]

7/36 • • • Couplers containing compounds with active methylene groups (G03C 7/327, G03C 7/333 take precedence) [5]

7/38 • • • • in rings [5]

7/384 • • • • in pyrazolone rings [5]

7/388 • • Processes for the incorporation in the emulsion of substances liberating photographically active agents or colour-coupling substances; Solvents therefor [5]

7/392 • • Additives (G03C 7/305, G03C 7/32 take precedence) [5]

7/396 • • • Macromolecular additives [5]

7/407 • • Development processes or agents therefor [5]

7/413 • • • Developers [5]

7/42 • • Bleach-fixing or agents therefor [3, 5]

7/44 • • Regeneration; Replenishers (G03C 7/42 takes precedence) [5]

7/46 • Subtractive colour processes not covered by group G03C 7/26; Materials therefor; Preparing or processing such materials [5]

- 8/00 Diffusion transfer processes or agents therefor; Photosensitive materials for such processes [5]**
- 8/02 • Photosensitive materials characterised by the image-forming section [5]
- 8/04 • • the substances transferred by diffusion consisting of inorganic compounds or of organo-metallic compounds derived from photosensitive noble metals [5]
- 8/06 • • • Silver salt diffusion transfer [5]
- 8/08 • • the substances transferred by diffusion consisting of organic compounds (G03C 8/04 takes precedence) [5]
- 8/10 • • • of dyes or their precursors [5]
- 8/12 • • • • characterised by the release mechanism [5]
- 8/14 • • • • • Oxidation of the chromogenic substance [5]
- 8/16 • • • • • • initially diffusible in alkaline environment [5]
- 8/18 • • • • • • • Dye developers [5]
- 8/20 • • • • • • • initially non-diffusible in alkaline environment [5]
- 8/22 • • • • • • • Reduction of the chromogenic substance [5]
- 8/24 • Photosensitive materials characterised by the image-receiving section [5]
- 8/26 • • Image-receiving layers (G03C 8/52 takes precedence) [5]
- 8/28 • • • containing development nuclei or compounds forming such nuclei [5]
- 8/30 • Additive processes using colour screens; Materials therefor; Preparing or processing such materials [5]
- 8/32 • Development processes or agents therefor (G03C 8/18 takes precedence) [5]
- 8/34 • • Containers for the agents (G03C 8/48, G03B 17/50 take precedence) [5]
- 8/36 • • Developers [5]
- 8/38 • • • containing viscosity increasing substances [5]
- 8/40 • • Development by heat [5]
- 8/42 • Structural details [5]

- 8/44 • • Integral units, i.e. the image-forming section not being separated from the image-receiving section [5]
- 8/46 • • • characterised by the trapping means or by gas releasing means [5]
- 8/48 • • • characterised by substances used for masking the image-forming section [5]
- 8/50 • • Peel-apart units, i.e. the image-forming section being separated from the image-receiving section [5]
- 8/52 • • Bases or auxiliary layers; Substances therefor [5]
- 8/54 • • • Timing layers [5]
- 8/56 • • • Mordant layers [5]

### **9/00 Stereo-photographic or similar processes**

- 9/02 • Parallax-stereogram
- 9/04 • Vectographic-image
- 9/06 • Anaglyph
- 9/08 • producing three-dimensional images

### **11/00 Auxiliary processes in photography** (characterised by apparatus used G03D 15/00)

- 11/02 • Marking or applying of text
- 11/04 • Retouching
- 11/06 • Smoothing; Renovating; Roughening; Matting; Cleaning; Lubricating; Flame retardant treatments [5]
- 11/08 • Varnishing, e.g. application of protective layers on finished photographic prints [5]
- 11/10 • • for protection from ultra-violet light
- 11/12 • Stripping or transferring intact photographic layers
- 11/14 • Pasting; Mounting
- 11/16 • Drying
- 11/18 • Colouring
- 11/20 • • with powdered or molten colours
- 11/22 • Preparing plates or films for the manufacture of photographic negatives by non-photographic processes
- 11/24 • Removing emulsion from waste photographic material; Recovery of photosensitive substances [5]

## **G03D APPARATUS FOR PROCESSING EXPOSED PHOTOGRAPHIC MATERIALS; ACCESSORIES THEREFOR**

### Subclass index

#### APPARATUS FOR PROCESSING EXPOSED MATERIAL

Liquid; gas; diffusion processing apparatus.....3/00, 5/00, 7/00, 9/00

Reversal processing apparatus.....11/00

Other apparatus and accessories.....13/00

APPARATUS FOR TREATING PROCESSED MATERIAL.....15/00

DARK-ROOMS.....17/00

- 3/00 Liquid processing apparatus involving immersion; Washing apparatus involving immersion** (G03D 9/00, G03D 11/00 take precedence)
- 3/02 • Details of liquid circulation
- 3/04 • • Liquid agitators
- 3/06 • • Liquid supply; Liquid circulation outside tanks
- 3/08 • having progressive mechanical movement of exposed material
- 3/10 • • for plates, films, or prints held individually
- 3/12 • • for plates, films or prints spread onto belt conveyors [2]

- 3/13 • • for long films or prints in the shape of strips, e.g. fed by roller assembly [2]
- 3/14 • • • with means for taking into account of elongation or contraction of films
- 3/16 • Treating exposed material in original holder

### **5/00 Liquid processing apparatus in which no immersion is effected; Washing apparatus in which no immersion is effected** (G03D 9/00, G03D 11/00 take precedence)

- 5/02 • using rupturable ampoules of liquid
- 5/04 • using liquid sprays
- 5/06 • Applicator pads, rollers, or strips [2]

## G03D

7/00	<b>Gas processing apparatus</b>	13/10	• • • Clips (G03D 13/14 takes precedence)
9/00	<b>Diffusion development apparatus</b>	13/12	• • • Frames (G03D 13/14 takes precedence)
9/02	• using rupturable ampoules of liquid	13/14	• • • for holding films in spaced convolutions
11/00	<b>Reversal processing apparatus</b>	15/00	<b>Apparatus for treating processed material</b>
13/00	<b>Processing apparatus or accessories therefor, not covered by groups G03D 3/00-G03D 11/00</b>	15/02	• Drying; Glazing (combined with processing apparatus G03D 3/00-G03D 13/00)
13/02	• Containers; Holding-devices	15/04	• Cutting; Splicing
13/04	• • Trays; Dishes; Tanks	15/06	• Applying varnish or other coating
13/06	• • • Light-tight tanks with provision for loading in daylight	15/08	• Flattening prints
13/08	• • Devices for holding exposed material; Devices for supporting exposed material	15/10	• Mounting, e.g. of processed material in a frame (frames specially adapted for projection G03B 21/64)
		17/00	<b>Dark-room arrangements not provided for in the other groups of this subclass; Portable dark-rooms</b>

**G03F PHOTOMECHANICAL PRODUCTION OF TEXTURED OR PATTERNED SURFACES, e.g. FOR PRINTING, FOR PROCESSING OF SEMICONDUCTOR DEVICES; MATERIALS THEREFOR; ORIGINALS THEREFOR; APPARATUS SPECIALLY ADAPTED THEREFOR** (phototypographic composing devices B41B; photosensitive materials or processes for photographic purposes G03C; electrography, sensitive layers or processes G03G)

### Note(s)

In this subclass, the following terms or expressions are used with the meanings indicated:

- "photosensitive" means not only sensitive of electromagnetic radiation but also to corpuscular radiation;
- "photosensitive compositions" covers photosensitive substances, e.g. quinonediazides, and, if applicable, binders or additives;
- "photosensitive materials" covers the photosensitive compositions, e.g. photoresists, the bases carrying them and, if applicable, auxiliary layers.

1/00	<b>Originals for photomechanical production of textured or patterned surfaces, e.g. masks, photo-masks or reticles; Mask blanks or pellicles therefor; Containers specially adapted therefor; Preparation thereof [3, 2012.01]</b>	1/40	• • Electrostatic discharge [ESD] related features, e.g. antistatic coatings or a conductive metal layer around the periphery of the mask substrate [2012.01]
	<b><u>Note(s) [2012.01]</u></b>	1/42	• • Alignment or registration features, e.g. alignment marks on the mask substrates [2012.01]
	In this main group, at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.	1/44	• • Testing or measuring features, e.g. grid patterns, focus monitors, sawtooth scales or notched scales [2012.01]
1/20	• Masks or mask blanks for imaging by charged particle beam [CPB] radiation, e.g. by electron beam; Preparation thereof [2012.01]	1/46	• • Antireflective coatings [2012.01]
1/22	• Masks or mask blanks for imaging by radiation of 100 nm or shorter wavelength, e.g. X-ray masks, extreme ultra-violet [EUV] masks; Preparation thereof [2012.01]	1/48	• • Protective coatings [2012.01]
1/24	• • Reflection masks; Preparation thereof [2012.01]	1/50	• Mask blanks not covered by groups G03F 1/20-G03F 1/26; Preparation thereof [2012.01]
1/26	• Phase shift masks [PSM]; PSM blanks; Preparation thereof [2012.01]	1/52	• Reflectors [2012.01]
1/28	• • with three or more diverse phases on the same PSM; Preparation thereof [2012.01]	1/54	• Absorbers, e.g. opaque materials [2012.01]
1/29	• • Rim PSM or outrigger PSM; Preparation thereof [2012.01]	1/56	• • Organic absorbers, e.g. photo-resists [2012.01]
1/30	• • Alternating PSM, e.g. Levenson-Shibuya PSM; Preparation thereof [2012.01]	1/58	• • having two or more different absorber layers, e.g. stacked multilayer absorbers [2012.01]
1/32	• • Attenuating PSM [att-PSM], e.g. halftone PSM or PSM having semi-transparent phase shift portion; Preparation thereof [2012.01]	1/60	• Substrates [2012.01]
1/34	• • Phase-edge PSM, e.g. chromeless PSM; Preparation thereof [2012.01]	1/62	• Pellicles or pellicle assemblies, e.g. having membrane on support frame; Preparation thereof [2012.01]
1/36	• Masks having proximity correction features; Preparation thereof, e.g. optical proximity correction [OPC] design processes [2012.01]	1/64	• • characterised by the frames, e.g. structure or material thereof [2012.01]
1/38	• Masks having auxiliary features, e.g. special coatings or marks for alignment or testing; Preparation thereof [2012.01]	1/66	• Containers specially adapted for masks, mask blanks or pellicles; Preparation thereof [2012.01]
		1/68	• Preparation processes not covered by groups G03F 1/20-G03F 1/50 [2012.01]
		1/70	• • Adapting basic layout or design of masks to lithographic process requirements, e.g. second iteration correction of mask patterns for imaging [2012.01]
		1/72	• • Repair or correction of mask defects [2012.01]
		1/74	• • • by charged particle beam [CPB], e.g. focused ion beam [2012.01]
		1/76	• • Patterning of masks by imaging [2012.01]

- 1/78 • • • by charged particle beam [CPB], e.g. electron beam [2012.01]
- 1/80 • • Etching [2012.01]
- 1/82 • • Auxiliary processes, e.g. cleaning [2012.01]
- 1/84 • • • Inspecting [2012.01]
- 1/86 • • • • by charged particle beam [CPB] [2012.01]
- 1/88 • prepared by photographic processes for producing originals simulating relief [2012.01]
- 1/90 • prepared by montage processes [2012.01]
- 1/92 • prepared from printing surfaces [2012.01]
- 3/00 Colour separation; Correction of tonal value**  
(photographic copying apparatus in general G03B)
- 3/02 • by retouching
- 3/04 • by photographic means
- 3/06 • • by masking
- 3/08 • by photoelectric means
- 3/10 • Checking the colour or tonal value of separation negatives or positives
- 5/00 Screening processes; Screens therefor**
- 5/02 • by projecting methods (cameras G03B)
- 5/04 • • changing the screen effect
- 5/06 • • changing the diaphragm effect
- 5/08 • • using line screens
- 5/10 • • using cross-line screens
- 5/12 • • using other screens, e.g. granulated screen
- 5/14 • by contact methods
- 5/16 • • using grey half-tone screens
- 5/18 • • using colour half-tone screens
- 5/20 • using screens for gravure printing
- 5/22 • combining several screens; Elimination of moire
- 5/24 • by multiple exposure, e.g. combined processes for line photo and screen
- 7/00 Photomechanical, e.g. photolithographic, production of textured or patterned surfaces, e.g. printed surfaces; Materials therefor, e.g. comprising photoresists; Apparatus specially adapted therefor**  
(using photoresist structures for special production processes, see the relevant places, e.g. B44C, H01L, e.g. H01L 21/00, H05K) [3, 5]
- 7/004 • Photosensitive materials (G03F 7/12, G03F 7/14 take precedence) [5]
- 7/008 • • Azides (G03F 7/075 takes precedence) [5]
- 7/012 • • • Macromolecular azides; Macromolecular additives, e.g. binders [5]
- 7/016 • • Diazonium salts or compounds (G03F 7/075 takes precedence) [5]
- 7/021 • • • Macromolecular diazonium compounds; Macromolecular additives, e.g. binders [5]
- 7/022 • • Quinonediazides (G03F 7/075 takes precedence) [5]
- 7/023 • • • Macromolecular quinonediazides; Macromolecular additives, e.g. binders [5]
- 7/025 • • Non-macromolecular photopolymerisable compounds having carbon-to-carbon triple bonds, e.g. acetylenic compounds (G03F 7/075 takes precedence) [5]
- 7/027 • • Non-macromolecular photopolymerisable compounds having carbon-to-carbon double bonds, e.g. ethylenic compounds (G03F 7/075 takes precedence) [5]
- 7/028 • • • with photosensitivity-increasing substances, e.g. photoinitiators [5]
- 7/029 • • • • Inorganic compounds; Onium compounds; Organic compounds having hetero atoms other than oxygen, nitrogen or sulfur [5]
- 7/031 • • • • Organic compounds not covered by group G03F 7/029 [5]
- 7/032 • • • with binders [5]
- 7/033 • • • • the binders being polymers obtained by reactions only involving carbon-to-carbon unsaturated bonds, e.g. vinyl polymers [5]
- 7/035 • • • • the binders being polyurethanes [5]
- 7/037 • • • • the binders being polyamides or polyimides [5]
- 7/038 • • Macromolecular compounds which are rendered insoluble or differentially wettable (G03F 7/075 takes precedence; macromolecular azides G03F 7/012; macromolecular diazonium compounds G03F 7/021) [5]
- 7/039 • • Macromolecular compounds which are photodegradable, e.g. positive electron resists (G03F 7/075 takes precedence; macromolecular quinonediazides G03F 7/023) [5]
- 7/04 • • Chromates (G03F 7/075 takes precedence) [5]
- 7/06 • • Silver salts (G03F 7/075 takes precedence) [5]
- 7/07 • • • used for diffusion transfer [5]
- 7/075 • • Silicon-containing compounds [5]
- 7/085 • • Photosensitive compositions characterised by adhesion-promoting non-macromolecular additives (G03F 7/075 takes precedence) [5]
- 7/09 • • characterised by structural details, e.g. supports, auxiliary layers (supports for printing plates in general B41N) [5]
- 7/095 • • • having more than one photosensitive layer (G03F 7/075 takes precedence) [5]
- 7/105 • • • having substances, e.g. indicators, for forming visible images [5]
- 7/11 • • • having cover layers or intermediate layers, e.g. subbing layers [5]
- 7/115 • • • having supports or layers with means for obtaining a screen effect or for obtaining better contact in vacuum printing [5]
- 7/12 • Production of screen printing forms or similar printing forms, e.g. stencils
- 7/14 • Production of collotype printing forms
- 7/16 • Coating processes; Apparatus therefor (applying coatings to base materials in general B05; applying photosensitive compositions to the base for photographic purposes G03C 1/74)
- 7/18 • • Coating curved surfaces
- 7/20 • Exposure; Apparatus therefor (photographic printing apparatus for making copies G03B 27/00) [4]
- 7/207 • • Means for focusing, e.g. automatically (combination of positioning and focusing G03F 9/02; systems for automatic generation of focusing signals in general G02B 7/28; means for automatic focusing of projection printing apparatus G03B 27/34) [4]
- 7/213 • • Exposing with the same light pattern different positions of the same surface at the same time (G03F 7/207 takes precedence) [4]
- 7/22 • • Exposing sequentially with the same light pattern different positions of the same surface (G03F 7/207 takes precedence) [4]
- 7/23 • • • Automatic means therefor [4]
- 7/24 • • Curved surfaces
- 7/26 • Processing photosensitive materials; Apparatus therefor (G03F 7/12-G03F 7/24 take precedence) [3, 5]

## G03F

- |   |   |
|---|---|
| <p>7/28 • • for obtaining powder images (G03F 3/10 takes precedence) [5]</p> <p>7/30 • • Imagewise removal using liquid means [5]</p> <p>7/32 • • • Liquid compositions therefor, e.g. developers [5]</p> <p>7/34 • • Imagewise removal by selective transfer, e.g. peeling away [5]</p> <p>7/36 • • Imagewise removal not covered by groups G03F 7/30-G03F 7/34, e.g. using gas streams, using plasma [5]</p> <p>7/38 • • Treatment before imagewise removal, e.g. prebaking [5]</p> | <p>7/40 • • Treatment after imagewise removal, e.g. baking [5]</p> <p>7/42 • • Stripping or agents therefor [5]</p> <p><b>9/00 Registration or positioning of originals, masks, frames, photographic sheets or textured or patterned surfaces, e.g. automatically</b> (G03F 7/22 takes precedence; preparation of photographic masks G03F 1/00; within photographic printing apparatus for making copies G03B 27/00) [4]</p> <p>9/02 • • combined with means for automatic focusing (automatic focusing in general G02B 7/09; systems for automatic generation of focusing signals G02B 7/28) [4]</p> |
|---|---|

**G03G ELECTROGRAPHY; ELECTROPHOTOGRAPHY; MAGNETOGRAPHY** (information storage based on relative movement between record carrier and transducer G11B; static stores with means for writing-in or reading-out information G11C; recording of television signals H04N 5/76)

### Note(s)

1. This subclass covers:
  - the production of permanent directly-visible pictures in conformity with an original picture or document, using an intermediate imagewise distribution of an electric or magnetic quantity, such as a charge pattern, an electric conductivity pattern, or a magnetic pattern;
  - the production of permanent directly-visible pictures using an intermediate imagewise distribution of an electric or magnetic quantity, when the origin and the way of generating said intermediate distribution are not relevant.
2. This subclass does not cover:
  - use of electric signals for the transmission of the picture information from the original to the reproduction, i.e. pictorial communication, which is covered by subclass H04N;
  - production of pictures by heat patterns exclusively, not using an electrostatic or magnetic pattern, which is covered by group B41M 5/00;
  - production of prints by transferring ink from a printing form to a printing surface, without physical contact and using the force of an electrostatic field, which is covered by subclass B41M;
  - selective printing mechanisms characterised by the selective supply of electric current, or the selective application of magnetism or radiation, to a printing material or impression-transfer material, which are covered by groups B41J 2/385, B41J 2/435.

### Subclass index

ORIGINAL RECORDING, MEMBERS AND MATERIALS.....	5/00, 7/00, 9/00
ELECTROGRAPHIC PROCESSES AND APPARATUS	
Using a charge pattern.....	13/00, 15/00
Using patterns other than charge patterns.....	17/00
Using deformation of thermoplastic layers.....	16/00
PROCESSES AND APPARATUS USING MAGNETIC PATTERNS.....	19/00
DETAILS NOT OTHERWISE PROVIDED FOR.....	8/00, 11/00, 21/00

- |   |  |
|---|--|
| <p><b>5/00 Recording-members for original recording by exposure e.g. to light, to heat, to electrons; Manufacture thereof; Selection of materials therefor</b> (recording surfaces for measuring apparatus G01D 15/34; photosensitive materials for photographic purposes G03C)</p> <p>5/02 • Charge-receiving layers (G03G 5/153 takes precedence) [5]</p> <p>5/022 • • Layers for surface-deformation imaging, e.g. frost imaging [2]</p> <p>5/024 • • Photoelectret layers [2]</p> <p>5/026 • • Layers in which during the irradiation a chemical reaction occurs whereby electrically conductive patterns are formed in the layers, e.g. for chemixerography [2]</p> <p>5/028 • • Layers in which after being exposed to heat patterns electrically conductive patterns are formed in the layers, e.g. for thermoxerography [2]</p> | <p>5/04 • • Photoconductive layers; Charge-generation layers or charge-transporting layers; Additives therefor; Binders therefor [2, 5]</p> <p>5/043 • • • Photoconductive layers characterised by having two or more layers or characterised by their composite structure [5]</p> <p>5/047 • • • • characterised by the charge-generation layers or charge-transporting layers [5]</p> <p>5/05 • • • Organic bonding materials; Methods for coating a substrate with a photoconductive layer; Inert supplements for use in photoconductive layers [2]</p> <p>5/06 • • • characterised by the photoconductive material being organic [5]</p> <p>5/07 • • • • Polymeric photoconductive materials [2]</p> <p>5/08 • • • characterised by the photoconductive material being inorganic [2, 5]</p> <p>5/082 • • • • and not being incorporated in a bonding material, e.g. vacuum deposited [2]</p> |
|---|--|

- 5/085 • • • and being incorporated in an inorganic bonding material, e.g. glass-like layers [2]
- 5/087 • • • and being incorporated in an organic bonding material [2]
- 5/09 • • • Sensitisers or activators, e.g. dyestuffs (G03G 5/12 takes precedence) [2]
- 5/10 • Bases for charge-receiving or other layers
- 5/12 • Recording members for multicolour processes [2]
- 5/14 • Inert intermediate or cover layers for charge-receiving layers (G03G 5/04 takes precedence) [2, 5]
- 5/147 • • Cover layers [5]
- 5/153 • Charge-receiving layers combined with additional photo- or thermo-sensitive, but not photoconductive, layers, e.g. silver-salt layers [5]
- 5/16 • Layers for recording by changing the magnetic properties, e.g. for Curie-point-writing [3]
- 7/00 Selection of materials for use in image-receiving members, i.e. for reversal by physical contact; Manufacture thereof** (photosensitive materials for photographic purposes G03C)
- 8/00 Layers covering the final reproduction, e.g. for protecting, for writing thereon [2]**
- 9/00 Developers [5]**
- 9/06 • the developer being electrolytic
- 9/08 • with toner particles [2]
- Note(s)**
- In groups G03G 9/083-G03G 9/12, in the absence of an indication to the contrary, classification is made in the last appropriate place.
- 9/083 • • Magnetic toner particles [5]
- 9/087 • • Binders for toner particles [5]
- 9/09 • • Colouring agents for toner particles [5]
- 9/093 • • Encapsulated toner particles [5]
- 9/097 • • Plasticisers; Charge controlling agents [5]
- 9/10 • • characterised by carrier particles [2, 5]
- 9/107 • • • having magnetic components [5]
- 9/113 • • • having coatings applied thereto [5]
- 9/12 • • in liquid developer mixtures [2]
- 9/125 • • • characterised by the liquid [5]
- 9/13 • • • characterised by polymer components [5]
- 9/135 • • • characterised by stabiliser or charge-controlling agents [5]
- 9/16 • Developers not provided for in groups G03G 9/06-G03G 9/135, e.g. solutions, aerosols [2]
- 9/18 • • Differentially-wetting liquid developers [2]
- 11/00 Selection of substances for use as fixing agents**
- 13/00 Electrographic processes using a charge pattern** (G03G 15/00, G03G 16/00, G03G 17/00 take precedence) [2, 5]
- 13/01 • for multicoloured copies [2]
- 13/02 • Sensitising, i.e. laying-down a uniform charge (devices for corona discharge *per se* H01T 19/00)
- 13/04 • Exposing, i.e. imagewise exposure by optically projecting the original image on a photoconductive recording material [6]
- 13/045 • • Charging or discharging distinct portions of the charge pattern on the recording material, e.g. discharging non-image areas, contrast enhancement (G03G 13/34, G03G 15/36, G03G 21/06 take precedence) [6]
- 13/05 • Imagewise charging, i.e. laying-down a charge in the configuration of an original image using a modulated stream of charged particles, e.g. of corona ions, modulated by a photoconductive control screen bearing a charge pattern or by optically activated charging means (using charging means controlled by electric image signals B41J) [6]
- 13/054 • using X-rays, e.g. electroradiography [6]
- 13/056 • using internal polarisation [2, 6]
- 13/06 • Developing
- 13/08 • • using a solid developer, e.g. powder developer
- 13/09 • • • using magnetic brush [2]
- 13/095 • • • Removing excess solid developer [6]
- 13/10 • • using a liquid developer
- 13/11 • • • Removing excess liquid developer, e.g. by heat [6]
- 13/14 • Transferring a pattern to a second base
- 13/16 • • of a toner pattern, e.g. a powder pattern
- 13/18 • • of a charge pattern
- 13/20 • Fixing, e.g. by using heat
- 13/22 • Processes involving the combination of more than one step according to groups G03G 13/02-G03G 13/20 (G03G 13/01 takes precedence) [2]
- 13/23 • • specially adapted for copying both sides of an original or for copying on both sides of a recording or image-receiving material [6]
- 13/24 • • whereby at least two steps are performed simultaneously [2]
- 13/26 • for the production of printing plates for non-xerographic printing processes [2]
- 13/28 • • Planographic printing plates [2]
- 13/30 • • Hectographic masters [2]
- 13/32 • • Relief printing plates [2]
- 13/34 • Editing, i.e. producing a composite image by copying one or more original images or parts thereof [6]
- 15/00 Apparatus for electrographic processes using a charge pattern** (G03G 16/00, G03G 17/00 take precedence) [2, 5]
- Note(s)**
- This group covers also processes in so far as they are characterised by the use or manipulation of apparatus classifiable *per se* in this group.
- 15/01 • for producing multicoloured copies [2]
- 15/02 • for laying down a uniform charge, e.g. for sensitising; Corona discharge devices (G03G 15/14 takes precedence) [6]
- 15/04 • for exposing, i.e. imagewise exposure by optically projecting the original image on a photoconductive recording material [6]
- 15/041 • • with variable magnification [6]
- 15/043 • • with means for controlling illumination or exposure (G03G 15/041 takes precedence) [6]
- 15/045 • • with means for charging or discharging distinct portions of the charge pattern on the recording material, e.g. for contrast enhancement or discharging non-image areas (G03G 15/36, G03G 21/06 take precedence) [6]
- 15/047 • • • for discharging non-image areas [6]
- 15/05 • for imagewise charging, e.g. photoconductive control screen, optically activated charging means (charging means controlled by electric image signals B41J) [6]
- 15/054 • using X-rays, e.g. electroradiography [6]
- 15/056 • using internal polarisation [2, 6]
- 15/06 • for developing
- 15/08 • • using a solid developer, e.g. powder developer

## G03G

- 15/09 • • • using magnetic brush [2]
- 15/095 • • • Removing excess solid developer [6]
- 15/10 • • using a liquid developer
- 15/11 • • • Removing excess liquid developer e.g. by heat [6]
- 15/14 • for transferring a pattern to a second base
- 15/16 • • of a toner pattern, e.g. a powder pattern
- 15/18 • • of a charge pattern
- 15/20 • for fixing, e.g. by using heat
- 15/22 • involving the combination of more than one step according to groups G03G 13/02-G03G 13/20 (G03G 15/01 takes precedence) [2]
- 15/23 • • specially adapted for copying both sides of an original or for copying on both sides of a recording or image-receiving material [6]
- 15/24 • • whereby at least two steps are performed simultaneously [2]
- 15/26 • • in which the charge pattern is obtained by projection of the entire image, i.e. whole-frame projection (G03G 15/04 takes precedence) [2, 6]
- 15/28 • • in which projection is obtained by line scanning (G03G 15/04 takes precedence) [2, 6]
- 15/30 • • • in which projection is formed on a drum [2]
- 15/32 • • in which the charge pattern is formed dotwise (G03G 15/04, G03G 15/05, G03G 15/34 take precedence) [2, 6]
- 15/34 • • in which the powder image is formed directly on the recording material [6]
- 15/36 • Editing, i.e. producing a composite image by copying one or more original images or parts thereof [6]
- 16/00 Electrographic processes using deformation of thermoplastic layers** (layers for surface-deformation imaging G03G 5/022); **Apparatus therefor** [2, 6]

**G03H HOLOGRAPHIC PROCESSES OR APPARATUS** (holograms, e.g. point holograms, used as ordinary optical elements G02B 5/32; analogue computers performing mathematical operations with the aid of optical elements G06E 3/00; holographic storage G11B 7/0065, G11C 13/04) [2]

### Note(s)

This subclass covers means for producing a record of the phase and amplitude information of a wave-front, which information can be used to reconstruct the original wave-front, or means to reconstruct the original wave-front from a record containing the phase and amplitude information of the wave-front.

- 1/00 Holographic processes or apparatus using light, infra-red, or ultra-violet waves for obtaining holograms or for obtaining an image from them; Details peculiar thereto** [2]
- 1/02 • Details [2]
- 1/04 • Processes or apparatus for producing holograms (G03H 1/26 takes precedence) [2]
- 1/06 • • using incoherent light [2]
- 1/08 • • Synthesising holograms [2]
- 1/10 • • using modulated reference beam [2]
- 1/12 • • • Spatial modulation, e.g. ghost imaging [2]
- 1/14 • • • Temporal modulation, e.g. extending depth of field or phase compensation for object motion [2]
- 1/16 • • using Fourier transform (G03H 1/12, G03H 1/14 take precedence) [2]
- 1/18 • • Particular processing of hologram record carriers, e.g. for obtaining blazed holograms [2]
- 1/20 • • Copying holograms by holographic means [2]

- 17/00 Electrographic processes using patterns other than charge patterns, e.g. an electric conductivity pattern; Processes involving a migration; e.g. photoelectrophoresis, photoelectrosolography; Processes involving a selective transfer, e.g. electrophoto-adhesive processes; Apparatus essentially involving a single such process** [5]
- 17/02 • with electrolytic development [2]
- 17/04 • using photoelectrophoresis [2]
- 17/06 • • Apparatus therefor [5]
- 17/08 • using an electrophoto-adhesive process, e.g. manifold imaging [5]
- 17/10 • using migration imaging, e.g. photoelectrosolography (G03G 17/04 takes precedence) [5]
- 19/00 Processes using magnetic patterns; Apparatus therefor**
- 21/00 Arrangements not provided for by groups G03G 13/00-G03G 19/00, e.g. cleaning, elimination of residual charge** [2]
- 21/02 • Counting the number of copies; Billing [6]
- 21/04 • Preventing copies being made of an original [6]
- 21/06 • Eliminating residual charges from a reusable imaging member [6]
- 21/08 • • using optical radiation [6]
- 21/10 • Collecting or recycling waste developer [6]
- 21/12 • • Toner waste containers [6]
- 21/14 • Electronic sequencing control [6]
- 21/16 • Mechanical means for facilitating the maintenance of the apparatus, e.g. modular arrangements [6]
- 21/18 • • using a processing cartridge [6]
- 21/20 • Humidity or temperature control [6]

- 1/22 • Processes or apparatus for obtaining an optical image from holograms (G03H 1/26-G03H 1/34 take precedence) [2]
- 1/24 • • using white light [2]
- 1/26 • Processes or apparatus specially adapted to produce multiple holograms or to obtain images from them, e.g. multicolour technique [2]
- 1/28 • • superimposed holograms only [2]
- 1/30 • • discrete holograms only [2]
- 1/32 • Systems for obtaining speckle elimination [2]
- 1/34 • Systems for reducing the space-spatial bandwidth product [2]
- 3/00 Holographic processes or apparatus using ultrasonic, sonic, or infrasonic waves for obtaining holograms; Processes or apparatus for obtaining an optical image from them** (G03H 1/22 takes precedence) [2]

5/00 **Holographic processes or apparatus using particles or using waves other than those covered by groups G03H 1/00 or G03H 3/00 for obtaining holograms;**

**Processes or apparatus for obtaining an optical image from them (G03H 1/22 takes precedence) [2]**

## G04 HOROLOGY

**G04B MECHANICALLY-DRIVEN CLOCKS OR WATCHES; MECHANICAL PARTS OF CLOCKS OR WATCHES IN GENERAL; TIME-PIECES USING THE POSITION OF THE SUN, MOON, OR STARS** (spring- or weight-driven mechanisms in general F03G; electromechanical clocks or watches G04C; electromechanical clocks with attached or built-in means operating any device at preselected times or after predetermined time intervals G04C 23/00; clocks or watches with stop devices G04F 7/08; structural details or housings specially adapted for electronic time-pieces with no moving parts G04G 17/00)

### Note(s)

This subclass covers mechanically-driven calendar clocks or clockwork calendars, and the mechanical part of such clocks or calendars.

### Subclass index

DRIVING MECHANISM.....	1/00
WINDING	
Normal; automatic; combined.....	3/00, 5/00, 7/00
Supervision; winding parts.....	9/00, 11/00
CLOCK MOVEMENT	
Escapement; frequency stabiliser; setting frequency gearwork; adjusting thereof.....	15/00, 17/00, 18/00, 13/00, 35/00
TIME INDICATING.....	19/00, 21/00, 23/00, 25/00
TIME SETTING.....	27/00
FRAMEWORKS; SUPPORTS; CALIBERS.....	29/00, 31/00, 33/00
PROTECTION OF CLOCKWORK	
Cases; crystals, glasses; other protection means.....	37/00, 39/00, 41/00, 43/00
UNUSUAL CLOCKS.....	45/00, 47/00, 49/00
SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....	99/00

### Driving mechanisms

#### **1/00 Driving mechanisms**

- 1/02 • with driving weight
- 1/04 • • Mechanisms in which the clockwork acts as the driving weight
- 1/06 • • with several weights
- 1/08 • • Driving weights; Chains; Chain wheels; Arbors for chain wheels
- 1/10 • with mainspring
- 1/12 • • with several mainsprings
- 1/14 • • Mainsprings; Bridles therefor (mainsprings with bridles G04B 1/18; alloys C22C; springs in general F16F)
- 1/16 • • Barrels; Arbors; Barrel axles (arrangements facilitating the removal of the mainspring G04B 33/14)
- 1/18 • • Constructions for connecting the ends of mainsprings with the barrel or the arbor
- 1/20 • • • Protecting arrangements against rupture or overwinding of the mainspring located in the barrel or attached to the barrel (in connection with keys or the like G04B 3/06, G04B 3/10; in connection with automatic winding devices G04B 5/24)
- 1/22 • • Compensation of changes in the motive power of the mainspring (by mechanical shaping of the mainspring G04B 1/14)

- 1/24 • with both mainsprings and driving weights
- 1/26 • driven by liquids or gases; Liquid or gaseous drives for mechanically-controlled secondary clocks

### Winding

- 3/00 Normal winding of clockworks by hand or mechanically; Winding-up several mainsprings or driving weights simultaneously**
- 3/02 • Removably-mounted keys or the like
- 3/04 • Rigidly-mounted keys, knobs, or crowns (divided winding stems G04B 37/06)
- 3/06 • Keys or the like with means preventing overwinding (protecting devices arranged in, or attached to, the barrel G04B 1/20; in connection with automatic winding devices G04B 5/24)
- 3/08 • by parts of the cases
- 3/10 • • Protecting means preventing overwinding (arranged in, or attached to, the barrel G04B 1/20; in connection with keys G04B 3/06; in connection with automatic winding devices G04B 5/24)
- 3/12 • by mechanical means, e.g. pneumatic motor (winding-up with electric or electromechanical means G04C)
- 5/00 Automatic winding-up**
- 5/02 • by self-winding caused by movement of the watch
- 5/04 • • by oscillating weights the movement of which is limited

- 5/06 • • • acting in one direction only
- 5/08 • • • acting in both directions
- 5/10 • • by oscillating weights the movement of which is not limited
- 5/12 • • • acting in one direction only
- 5/14 • • • acting in both directions
- 5/16 • • Construction of the weights
- 5/18 • • Supports, suspensions, or guide arrangements, for oscillating weights
- 5/19 • • • Suspension of the oscillating weight at its centre of rotation [3]
- 5/20 • by movements of other objects, e.g. by opening hand-bag, by opening case, by opening door; Winding-up by wind power
- 5/22 • by thermometric, barometric, or like effects or alterations
- 5/24 • Protecting means preventing overwinding (arranged in, or attached to, the barrel G04B 1/20; in connection with keys or the like G04B 3/06; in connection with parts of the cases G04B 3/10)

#### 7/00 Combined normal and automatic winding-up

#### 9/00 Supervision of the state of winding, e.g. indicating the amount of winding

- 9/02 • Devices controlled by such state, e.g. device affording protection against overwinding (protecting means preventing overwinding arranged in or on the barrel G04B 1/20; protecting means in connection with keys or the like G04B 3/06; in connection with parts of the cases G04B 3/10; in connection with automatic winding devices G04B 5/24)

#### 11/00 Click devices, stop clicks or clutches for winding

- 11/02 • Devices allowing the motion of a rotatable part in only one direction [3]
- 11/04 • • Pawl constructions therefor, e.g. pawl secured to an oscillating member actuating a ratchet [3]

#### 13/00 Gearwork

- 13/02 • Wheels; Pinions; Spindles; Pivots (bearings G04B 31/00)

#### 15/00 Escapements (electric or magnetic means for converting oscillatory to rotary motion in electromechanical time-pieces G04C 5/00)

- 15/02 • permanently in contact with the regulating mechanism
- 15/04 • • Cylinder escapements
- 15/06 • Free escapements
- 15/08 • • Lever escapements
- 15/10 • with constant impulses for the regulating mechanism
- 15/12 • Adjusting (tools therefor G04D 1/02); Restricting the amplitude of the lever or the like
- 15/14 • Component parts or constructional details, e.g. construction of the lever or the escape wheel

#### 17/00 Mechanisms for stabilising frequency [3]

- 17/02 • Oscillators acting by gravity, e.g. pendulum swinging in a plane
- 17/04 • Oscillators acting by spring tension
- 17/06 • • Oscillators with hairsprings, e.g. balance
- 17/08 • • Oscillators with coil springs stretched and unstretched axially

- 17/10 • • Oscillators with torsion strips or with springs acting in the same manner as torsion strips, e.g. weight oscillating in a horizontal plane
- 17/20 • Compensation of mechanisms for stabilizing frequency
- 17/22 • • for the effect of variations of temperature (alloys independent of variations of temperature C22C)
- 17/24 • • for the effect of variations of atmospheric pressure
- 17/26 • • for the effect of variations of the impulses
- 17/28 • • for the effect of unbalance of the weights, e.g. tourbillon
- 17/30 • Rotating governors, e.g. centrifugal governors, fan governors (for striking mechanism G04B 21/06)
- 17/32 • Component parts or constructional details, e.g. collet, stud
- 17/34 • • for fastening the hairspring onto the balance [3]

#### 18/00 Mechanisms for setting frequency [3]

- 18/02 • Regulator devices; Indexing devices [3]
- 18/04 • Adjusting the beat of the pendulum, balance, or the like, e.g. putting into beat [3]
- 18/06 • • by setting the collet or the stud of a hairspring [3]
- 18/08 • Component parts or constructional details [3]

#### Time indicating

#### 19/00 Indicating the time by visual means (by electric lamps G04C 17/02; display arrangements in general G09)

- 19/02 • Back-gearing arrangements between gear train and hands
- 19/04 • Hands; Discs with a single mark or the like
- 19/06 • Dials (for time-pieces without clockwork G04B 49/04)
- 19/08 • • Geometrical arrangement of the graduations
- 19/10 • • Ornamental shape of the graduations or the surface of the dial; Attachment of graduations to the dial
- 19/12 • • Selection of materials for dials or graduations
- 19/14 • • Fastening the dials to the clock or the watch plates
- 19/16 • • Shiftable dials, e.g. indicating alternately from 1 to 12 and from 13 to 24
- 19/18 • • Graduations on the crystal or glass, on the bezel, or on the rim
- 19/20 • Indicating by numbered bands, drums, discs, or sheets
- 19/21 • • Drums [3]
- 19/22 • Arrangements for indicating different local apparent times; Universal time-pieces
- 19/23 • • by means of additional hands or additional pairs of hands [3]
- 19/24 • Clocks or watches with date indicators; Clockwork calendars
- 19/243 • • characterised by the shape of the date indicator [3]
- 19/247 • • • disc-shaped [3]
- 19/25 • • • • Devices for setting the date indicators manually [3]
- 19/253 • • • • Driving or releasing mechanisms [3]
- 19/257 • • • drum-shaped [3]
- 19/26 • Clocks or watches with indicators for tides, for the phases of the moon, or the like
- 19/28 • Adjustable guide marks or pointers for indicating determined points of time
- 19/30 • Illumination of dials or hands
- 19/32 • • by luminescent substances
- 19/34 • Position of the hands projected optically

- 21/00 Indicating the time by acoustic means** (at preselected times G04B 23/00; by electro-acoustic means G04C 21/04; sound-producing apparatus *per se* G10)
- 21/02 • Regular striking mechanisms giving the full hour, half hour, or quarter hour
- 21/04 • • Hour wheels; Racks or rakes; Snails or similar control mechanisms
- 21/06 • • Details of striking mechanisms, e.g. hammer, fan governor
- 21/08 • • Sounding bodies; Whistles; Musical apparatus (with electro-acoustic transmitters G04C 21/00)
- 21/10 • • Releasing or locking the regular stroke, e.g. for silence during the night
- 21/12 • • Reiterating watches or clocks
- 21/14 • • Winding-up the striking mechanism by the clockwork; Winding-up the clockwork by the striking mechanism
- 23/00 Arrangements producing acoustic signals at preselected times** (electrically-released alarm signals G04C 21/00; metronomes G04F 5/02; sound-producing apparatus *per se* G10)
- 23/02 • Alarm clocks
- 23/03 • • Alarm signal stop arrangements [3]
- 23/04 • • with coarse and fine setting of the preselected time
- 23/06 • • adjustable for several preselected times with automatic stopping of the signal
- 23/08 • • operating on successive days without resetting; operating only once in each 24 hours
- 23/10 • • with presignal; with repeated signal; with changeable intensity of sound
- 23/12 • • Alarm watches to be worn in pockets or on the wrist (giving signals by stimulating the skin G04B 25/04)
- 25/00 Indicating the time by other means or by combined means** (electric or electromechanical indicating G04C)
- 25/02 • by feeling; Clocks or watches for blind persons
- 25/04 • • Alarm clocks or watches with devices stimulating the skin
- 25/06 • by moving figures, e.g. cuckoo-clock, trumpet clock
- 27/00 Mechanical devices for setting the time-indicating means**
- 27/02 • by making use of the winding means
- 27/04 • • with clutch wheel
- 27/06 • • with rocking bar
- 27/08 • by using parts of the case

**Frameworks, supports, or arrangements of the clockwork parts in relation to each other, so-called "calibers"**

- 29/00 Frameworks**
- 29/02 • Plates; Bridges; Cocks
- 29/04 • Connecting or supporting parts
- 31/00 Bearings; Point suspensions or counter-point suspensions; Pivot bearings; Single parts therefor** (bearings in general F16C)
- 31/004 • characterised by the material used [3]
- 31/008 • • Jewel bearings (G04B 31/04 takes precedence) [3]
- 31/012 • • Metallic bearings [3]
- 31/016 • • Plastic bearings [3]
- 31/02 • Shock-damping bearings
- 31/04 • • with jewel hole and cap jewel [3]
- 31/06 • Manufacture or mounting processes [3]

- 31/08 • Lubrication [3]
- 33/00 Calibers**
- 33/02 • Circular calibers
- 33/04 • Non-circular calibers
- 33/06 • of extremely flat shape
- 33/08 • in which the gear train is arranged in different planes, e.g. parallel or inclined to each other (G04B 33/10 takes precedence)
- 33/10 • with seconds hand arranged in the centre of the dial
- 33/12 • for extremely-long running times
- 33/14 • Calibers of which the mainsprings or barrels are easily removable (mainsprings G04B 1/14; barrels, arbors G04B 1/16)
- 33/16 • with arrangements affording protection of the clockwork against damage as a consequence of a rupture of the mainspring
- 35/00 Adjusting the gear train, e.g. the backlash of the arbors, depth of meshing of the gears**

**Protection of the clockwork against damage from outside**

- 37/00 Cases**
- 37/02 • Evacuated cases; Cases filled with gases or liquids; Cases containing substances for absorbing or binding moisture or dust
- 37/04 • Mounting the clockwork in the case; Shock-absorbing mountings
- 37/05 • • Fixed mountings for pocket or wrist watches [3]
- 37/06 • Forming the passage for the winding stem through the case; Divided winding stems
- 37/08 • Hermetic sealing of openings, joints, passages, or slits
- 37/10 • • of winding stems
- 37/11 • • of the back cover of pocket or wrist watches [3]
- 37/12 • Cases for special purposes, e.g. watch combined with ring, watch combined with button (watch guards or protectors A45C 11/10, A45C 11/12; watches combined with cosmetic powder containers A45D 33/30)
- 37/14 • Suspending devices, supports, or stands for time-pieces in so far as they form part of the case (wrist-watch straps, fastening means therefor A44C 5/00)
- 37/16 • • Fastening the case to the bracelet [3]
- 37/18 • for pocket or wrist watches (G04B 37/02-G04B 37/16 takes precedence) [3]
- 37/20 • • with hinged covers or backs [3]
- 37/22 • Materials or processes of manufacturing pocket watch or wrist watch cases [3]
- 39/00 Watch crystals; Fastening or sealing crystals; Clock glasses**
- 39/02 • Sealing crystals or glasses [3]
- 41/00 Locking or holding devices for pendulums, chimes, or the like, for use during transport**
- 43/00 Protecting clockworks by shields or other means against external influences, e.g. magnetic fields**

**Clocks with unusual features**

- 45/00 Time-pieces of which the indicating means or cases provoke special effects, e.g. aesthetic effect** (ornamental shaping of dials G04B 19/10)

## G04B

- 45/02 • Time-pieces of which the clockwork is visible partly or wholly
- 45/04 • Time-pieces with invisible drive, e.g. with hands attached to rotating glass disc

- 47/00 Time-pieces combined with other articles which do not interfere with the running or the time-keeping of the time-piece** (G04B 37/12 takes precedence; writing or drawing implements with devices for indicating time B43K 29/087; combinations with vehicle mirror assemblies B60R 1/12; combined with cameras, projectors, or photographic printing apparatus G03B 29/00)
- 47/02 • Installations within mirrors, pictures, furniture, or other household articles

- 47/04 • with attached ornaments or amusement apparatus
- 47/06 • with attached measuring instruments, e.g. pedometer, barometer, thermometer, compass

- 49/00 Time-pieces using the position of the sun, moon, or stars**
- 49/02 • Sundials
- 49/04 • • Graduation or shaping of dials
- 99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**G04C ELECTROMECHANICAL CLOCKS OR WATCHES** (mechanical parts of clocks or watches in general G04B; electronic time-pieces with no moving parts, electronic circuitry for producing timing pulses G04G)

### Note(s)

This subclass covers electric features of mechanically-driven clocks or watches, such as electric winding of such clocks or the provision of electric contacts thereon.

### Subclass index

ELECTRIC WINDING OF MECHANICAL CLOCKS.....	1/00
ELECTROMECHANICAL CLOCK MOVEMENTS; ELECTRIC OR MAGNETIC ESCAPEMENTS.....	3/00, 5/00
TIME INDICATING	
Optical; acoustical means.....	17/00, 19/00, 21/00
TIME SETTING.....	9/00
POWER SUPPLIES.....	10/00
SYNCHRONISATION; MASTER-AND-SLAVE CLOCK SYSTEM; SYNCHRONOUS-MOTOR CLOCKS.....	11/00, 13/00, 15/00
CLOCKS FOR OPERATING A DEVICE AT A PRESELECTED TIME.....	23/00
SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....	99/00

### Electric winding of mechanical clocks; Independent electric clocks or watches

- 1/00 Winding mechanical clocks electrically** (winding mechanically G04B 3/00)
- 1/02 • by electromagnets
- 1/04 • by electric motors with rotating or with reciprocating movement
- 1/06 • • winding-up springs
- 1/08 • • raising weights
- 1/10 • Protection against overwinding (in mechanical clocks or watches G04B 1/20, G04B 3/06, G04B 3/10)
- 1/12 • • of the spring
- 1/14 • • of the weights
- 3/00 Electromechanical clocks or watches independent of other time-pieces and in which the movement is maintained by electric means** (clocks driven by synchronous motors G04C 15/00)
- 3/02 • wherein movement is regulated by a pendulum
- 3/027 • • using electromagnetic coupling between electric power source and pendulum (G04C 3/033 takes precedence) [3]
- 3/033 • • using torsion pendulums; using conical pendulums (construction thereof G04B 17/00) [3]
- 3/04 • wherein movement is regulated by a balance

- 3/06 • • using electromagnetic coupling between electric power source and balance [3]
- 3/08 • wherein movement is regulated by a mechanical oscillator other than a pendulum or balance, e.g. by a tuning fork [3]
- 3/10 • • driven by electromagnetic means [3]
- 3/12 • • driven by piezo-electric means; driven by magneto-strictive means [3]
- 3/14 • incorporating a stepping motor (G04C 3/02-G04C 3/12 take precedence) [3]
- 3/16 • incorporating an electro-dynamic continuously rotating motor (G04C 3/02-G04C 3/12 take precedence) [3]
- 3/18 • incorporating electro-thermal or electro-pneumatic driving means [3]
- 5/00 Electric or magnetic means for converting oscillatory to rotary motion in time-pieces, i.e. electric or magnetic escapements** (regulators G04C 3/00) [3]
- 9/00 Electrically-actuated devices for setting the time-indicating means** (of slave clocks G04C 13/03; radio-controlled time-pieces G04R) [3]
- 9/04 • by blocking the driving means [3]
- 9/06 • by decoupling the driving means (combined with blocking means G04C 9/04) [3]
- 9/08 • by electric drive [3]

**10/00 Arrangements of electric power supplies in time-pieces [3]**

- 10/02 • the power supply being a radioactive source [3]
- 10/04 • with means for indicating the condition of the power supply [3]

**Electric clock installations; Master-and-slave clock systems; Synchronous-motor clocks****11/00 Synchronisation of independently-driven clocks (radio-controlled time-pieces G04R)**

- 11/04 • over a line (transmitting time signals over telephone networks H04M 11/06)
- 11/06 • with direct mechanical action on the time-indicating means [3]
- 11/08 • using an electric magnet or motor [3]

**13/00 Driving mechanisms for clocks by master clocks**

- 13/02 • Circuit arrangements; Electric clock installations
- 13/03 • • Pulse transmission systems with additional means for setting the time indication of slave clocks [3]
- 13/04 • • Master clocks
- 13/06 • • • Contact devices (for simultaneously winding several clocks G04C 1/00)
- 13/08 • Slave clocks actuated intermittently
- 13/10 • • by electromechanical step-advancing mechanisms
- 13/11 • • • with rotating armature [3]
- 13/12 • • by continuously-rotating electric motors [3]
- 13/14 • • by electrically-released mechanical driving mechanisms

**15/00 Clocks driven by synchronous motors****Indicating the time or producing time signals electrically****17/00 Indicating the time optically by electric means**

(G04C 19/00 takes precedence; liquid crystal materials C09K 19/00; by mechanical means G04B 19/00, G04B 19/20) [3]

- 17/02 • by electric lamps

**19/00 Producing optical time signals at prefixed times by electric means**

- 19/02 • by electric lamps
- 19/04 • by indicating members moved electrically, e.g. flap, band

**21/00 Producing acoustic time signals by electrical means**

- 21/02 • Constructional details (G04C 21/04, G04C 21/16 take precedence)
- 21/04 • Indicating the time of the day (acoustic indication of time G04B 21/00)
- 21/06 • • by striking mechanism
- 21/08 • • • with snail
- 21/10 • • • with locking plate
- 21/12 • • by electro-acoustic means
- 21/14 • • • Electro-acoustic time announcement, i.e. spoken
- 21/16 • producing the signals at adjustable fixed times
- 21/18 • • by mechanically unlocking an electromechanical vibrator, e.g. actuated by the leakage flux of the electric driving means
- 21/20 • • by closing a contact to ring an electromechanical alarm
- 21/22 • • • put into action by the arbor of a mechanical alarm work

- 21/24 • • • put into action by the spring of a mechanical alarm work
- 21/26 • • • put into action by the vibrations caused by the operation of a mechanical alarm work
- 21/28 • • by closing a contact to put into action electro-acoustic means, e.g. awakening by music
- 21/30 • • with provision for a number of operations at different times, e.g. ringing the bells in a school
- 21/32 • • • giving indications at a number of places, each at a different time, e.g. system of alarms in a hotel
- 21/34 • • Devices on watches or similar portable time-pieces
- 21/36 • • Signal-repeating devices
- 21/38 • • Adjusting the duration of signals

**23/00 Clocks with attached or built-in means operating any device at preselected times or after preselected time-intervals**

(if restricted to producing acoustic time signals by electrical means G04C 21/00; mechanical alarm clocks G04B 23/02; apparatus which can be set and started to measure-off predetermined intervals G04F 3/06; time or time-programme switches which automatically terminate their operation after the programme is completed H01H 43/00)

- 23/02 • Constructional details
- 23/04 • • Housings, supports, shielding, or similar stationary parts
- 23/06 • • Driving or regulating means
- 23/08 • • Programming means
- 23/10 • • for actuating any element which operates, or initiates the operation of, the device concerned
- 23/12 • • Electric circuitry
- 23/14 • Mechanisms continuously running to relate the operation(s) to the time of day
- 23/16 • • acting only at one preselected time or during one adjustable time interval
- 23/18 • • for operating one device at a number of different times
- 23/20 • • • with contacts operated, or formed, by clock hands or elements of similar form
- 23/22 • • • with the actuating element carried by a disc
- 23/24 • • • • the actuating element controlling another element mechanically
- 23/26 • • for operating a number of devices at different times
- 23/28 • • • with contacts operated, or formed, by clock hands or elements of similar form
- 23/30 • • • with the actuating element carried by a disc
- 23/32 • • • • the actuating element controlling another element mechanically
- 23/34 • • with provision for automatic modification of the programme, e.g. on Sunday
- 23/36 • • • by external influences
- 23/38 • Mechanisms measuring a chosen time interval independently of the time of day at which the interval starts
- 23/40 • • using continuously-running mechanism
- 23/42 • • acting only at the end of a single time interval
- 23/44 • • • with provision for selection from a number of preset intervals
- 23/46 • • • with provision for adjustment of the interval (G04C 23/44 takes precedence)
- 23/48 • • acting at the ends of successive time intervals

- 23/50 • • with provision for modification of the interval(s) by external influences

**99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

## **G04D APPARATUS OR TOOLS SPECIALLY DESIGNED FOR MAKING OR MAINTAINING CLOCKS OR WATCHES**

### Subclass index

HAND AND MACHINE TOOLS.....	1/00, 3/00
LUBRICATING DEVICES.....	5/00
MEASURING AND TESTING APPARATUS.....	7/00
DEMAGNETISING DEVICES.....	9/00
SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....	99/00

#### **1/00 Gripping, holding, or supporting devices**

- 1/02 • Tweezers; Vice clamps or other special hand tools for watchmakers
- 1/04 • Tools for setting springs
- 1/06 • Supporting devices for clockworks or parts of time-pieces
- 1/08 • Tools for setting or removing hands
- 1/10 • Devices for opening or closing watch bottoms or covers

#### **3/00 Watchmakers' or watch-repairers' machines or tools for working materials**

- 3/02 • Lathes, with one or more supports; Burnishing machines, with one or more supports
- 3/04 • Devices for placing bearing jewels, bearing sleeves, or the like in position
- 3/06 • Devices for shaping or setting watch glasses
- 3/08 • Machines or apparatus for cleaning

#### **5/00 Oiling devices; Special lubricant containers for watchmakers**

#### **7/00 Measuring, counting, calibrating, testing, or regulating apparatus**

- 7/02 • for mainsprings
- 7/04 • for gearwork
- 7/06 • for escapements
- 7/08 • for balance wheels
- 7/10 • for hairsprings
- 7/12 • Timing devices for clocks or watches for comparing the rate of the oscillating member with a standard

#### **9/00 Demagnetising devices**

**99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**G04F TIME-INTERVAL MEASURING** (measuring pulse characteristics G01R, e.g. G01R 29/02; in radar or like systems G01S; masers H01S 1/00; generation of oscillations H03B; generation or counting of pulses, frequency dividing H03K; analogue/digital conversion in general H03M 1/00) [2]

### Note(s)

This subclass covers:

- apparatus for measuring-off predetermined time intervals;
- apparatus for producing such intervals as timing standards, e.g. metronomes;
- apparatus for measuring unknown intervals, e.g. precision systems for short-time-interval measurement.

### Subclass index

MEASURING PREDETERMINED TIME INTERVALS	
Producing time standards.....	5/00
Apparatus: without driving mechanisms; with driving mechanisms.....	1/00, 3/00
MEASURING UNKNOWN TIME INTERVALS	
Mechanically; electromechanically; electrically; otherwise.....	7/00, 8/00, 10/00, 13/00

#### **1/00 Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals without driving mechanisms, e.g. egg timer** (time or time-programme switches which automatically terminate their operation after the programme is completed H01H 43/00)

- 1/02 • by consuming prefixed quantities of materials, e.g. by burning candle
- 1/04 • by movement or acceleration due to gravity

- 1/06 • • by flowing-away of a prefixed quantity of fine-granular or liquid materials, e.g. sand-glass, water-clock
- 1/08 • • by a body falling a prefixed distance in air or in a viscous material

- 3/00 Apparatus which can be set and started to measure-off predetermined or adjustably-fixed time intervals with driving mechanisms, e.g. dosimeter with clockwork** (time or time-programme switches which automatically terminate their operation after the programme is completed H01H 43/00)
- 3/02 • with mechanical driving mechanisms
- 3/04 • • Additional arrangements in connection with ordinary non-electric clocks for this purpose
- 3/06 • with electric driving mechanisms
- 3/08 • • Additional arrangements in connection with ordinary electric clocks for this purpose
- 5/00 Apparatus for producing preselected time intervals for use as timing standards** (generating clock signals for electric digital computers G06F 1/04; automatic frequency control or stabilisation of generators in general H03L)
- 5/02 • Metronomes
- 5/04 • using oscillators with electromechanical resonators [2]
- 5/06 • • using piezo-electric resonators [2]
- 5/08 • • using magnetostrictive resonators [2]
- 5/10 • using electric or electronic resonators (G04F 5/14 takes precedence) [2]
- 5/12 • using fluidic devices [2]
- 5/14 • using atomic clocks [2]
- 5/16 • using pulses produced by radio-isotopes [2]
- 7/00 Apparatus for measuring unknown time intervals by non-electric means** (G04F 13/06 takes precedence) [2]
- 7/02 • by measuring the distance of fall or the final velocity of a falling body
- 7/04 • using a mechanical oscillator [2]
- 7/06 • • running only during the time interval to be measured, e.g. stop-watch
- 7/08 • • Watches or clocks with stop devices, e.g. chronograph
- 7/10 • Means used apart from the time-piece for starting or stopping same [2]
- 8/00 Apparatus for measuring unknown time intervals by electromechanical means** [2]
- 8/02 • using an electromechanical oscillator [2]
- 8/04 • • using a piezo-electric oscillator [2]
- 8/06 • • using a magnetostrictive oscillator [2]
- 8/08 • Means used apart from the time-piece for starting or stopping same [2]
- 10/00 Apparatus for measuring unknown time intervals by electric means** [2]
- 10/02 • using oscillators with passive electric resonator, e.g. lumped LC [2]
- 10/04 • by counting pulses or half-cycles of an ac [2]
- 10/06 • by measuring phase [2]
- 10/08 • using pulses produced by radio-isotopes [2]
- 10/10 • by measuring electric or magnetic quantities changing in proportion to time [2]
- 13/00 Apparatus for measuring unknown time intervals by means not provided for in groups G04F 5/00-G04F 10/00** [2]
- 13/02 • using optical means [2]
- 13/04 • using electrochemical means [2]
- 13/06 • using fluidic means [2]

## G04G ELECTRONIC TIME-PIECES [3]

### Note(s)

- This subclass covers:
  - electronic time-pieces with no moving parts;
  - electronic circuitry for producing timing pulses irrespective of the nature of the time-indicating means utilised.
- This subclass does not cover electronic time-pieces with moving parts, which are covered by subclass G04C.

### Subclass index

PRODUCING TIMING PULSES.....	3/00
TIME-SETTING; SYNCHRONISING.....	5/00, 7/00
TIME- OR DATE-INDICATING	
Visual; optical signals.....	9/00, 11/00, 13/00
OPERATING A DEVICE AT PRESELECTED TIMES.....	15/00
STRUCTURAL DETAILS; HOUSINGS.....	17/00
ELECTRIC POWER SUPPLY CIRCUITS.....	19/00
INPUT OR OUTPUT DEVICES INTEGRATED IN TIME-PIECES.....	21/00
OTHER SUBJECTS.....	99/00

- 3/00 Producing timing pulses** (driving circuits for stepping motors G04C 3/14; producing preselected time intervals for use as timing standards G04F 5/00; pulse technique in general H03K; control, synchronisation, or stabilisation of generators in general H03L) [3]
- 3/02 • Circuits for deriving low frequency timing pulses from pulses of higher frequency (pulse frequency dividers in general H03K 23/00-H03K 29/00) [3]
- 3/04 • Temperature-compensating arrangements [7]
- 5/00 Setting, i.e. correcting or changing, the time-indication** (radio-controlled time-pieces G04R) [3, 2013.01]
- 5/02 • by temporarily changing the number of pulses per unit time, e.g. quick-feed method [3]
- 5/04 • by setting each of the displayed values, e.g. date, hour, independently [3]
- 7/00 Synchronisation** (radio-controlled time-pieces G04R) [3]

## G04G

- 9/00 Visual time or date indication means [3]**
- 9/02 • by selecting desired characters out of a number of characters or by selecting indicating elements the position of which represent the time, e.g. by using multiplexing techniques [3]
- 9/04 • • by controlling light sources, e.g. electroluminescent diodes [3]
- 9/06 • • using light valves, e.g. liquid crystals [3]
- 9/08 • by building-up characters using a combination of indicating elements, e.g. by using multiplexing techniques [3]
- 9/10 • • by controlling light sources, e.g. electroluminescent diodes [3]
- 9/12 • • using light valves, e.g. liquid crystals [3]
- 11/00 Producing optical signals at preselected times [3]**
- 13/00 Producing acoustic time signals [3]**
- 13/02 • at preselected times, e.g. alarm clocks [3]
- 15/00 Time-pieces comprising means to be operated at preselected times or after preselected time intervals (G04G 11/00, G04G 13/00 take precedence; pulse delay circuits H03K 5/13; electronic time-delay switches H03K 17/28; electronic time-programme switches which automatically terminate their operation after the programme is completed H03K 17/296; time programming for television signal recording H04N 5/761) [3]**

## G04R RADIO-CONTROLLED TIME-PIECES [2013.01]

- 20/00 Setting the time according to the time information carried or implied by the radio signal [2013.01]**
- 20/02 • the radio signal being sent by a satellite, e.g. GPS [2013.01]
- 20/04 • • Tuning or receiving; Circuits therefor [2013.01]
- 20/06 • • Decoding time data; Circuits therefor [2013.01]
- 20/08 • the radio signal being broadcast from a long-wave call sign, e.g. DCF77, JJY40, JJY60, MSF60 or WWVB [2013.01]
- 20/10 • • Tuning or receiving; Circuits therefor [2013.01]
- 20/12 • • Decoding time data; Circuits therefor [2013.01]
- 20/14 • the radio signal being a telecommunication standard signal, e.g. GSM, UMTS or 3G [2013.01]
- 20/16 • • Tuning or receiving; Circuits therefor [2013.01]
- 20/18 • • Decoding time data; Circuits therefor [2013.01]
- 20/20 • the radio signal being an AM/FM standard signal, e.g. RDS [2013.01]
- 20/22 • • Tuning or receiving; Circuits therefor [2013.01]
- 20/24 • • Decoding time data; Circuits therefor [2013.01]
- 20/26 • the radio signal being a near-field communication signal [2013.01]

## G05 CONTROLLING; REGULATING

### Note(s)

1. This class covers methods, systems, and apparatus for controlling, in general.
2. In this class, the following terms or expressions are used with the meanings indicated:

- 17/00 Structural details; Housings** (constructional details of radio-controlled time-pieces, e.g. antennas G04R 60/00) [7, 2013.01]
- 17/02 • Component assemblies [7]
- 17/04 • • Mounting of electronic components [7]
- 17/06 • • Electric connectors, e.g. conductive elastomers [7]
- 17/08 • Housings [7]
- 19/00 Electric power supply circuits specially adapted for use in electronic time-pieces [7]**
- 19/02 • Conversion or regulation of current or voltage [7]
- 19/04 • • Capacitive voltage division or multiplication [7]
- 19/06 • • Regulation [7]
- 19/08 • Arrangements for preventing voltage drop due to overloading the power supply [7]
- 19/10 • Arrangements for supplying back-up power [7]
- 19/12 • Arrangements for reducing power consumption during storage [7]
- 21/00 Input or output devices integrated in time-pieces [2010.01]**
- 21/02 • Detectors of external physical values, e.g. temperature [2010.01]
- 21/04 • using radio waves (radio-controlled time-pieces G04R) [2010.01, 2013.01]
- 21/06 • using voice [2010.01]
- 21/08 • Touch switches specially adapted for time-pieces [2010.01]
- 99/00 Subject matter not provided for in other groups of this subclass [2010.01]**

- "controlling" means influencing a variable in any way, e.g. changing its direction or its value (including changing it to or from zero), maintaining it constant, limiting its range of variation;
  - "regulation" means maintaining a variable automatically at a desired value or within a desired range of values. The desired value or range may be fixed, or manually varied, or may vary with time according to a predetermined "programme" or according to variation of another variable. Regulation is a form of control;
  - "automatic control" is often used in the art as a synonym for "regulation".
3. Attention is drawn to the Notes following the title of section G, especially as regards the definition of the term "variable".

**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 F15B; valves per se F16K; characterised by mechanical features only G05G; sensitive elements, see the appropriate subclasses, e.g. G12B, subclasses of G01, H01; correcting units, see the appropriate subclasses, e.g. H02K)

#### Note(s)

1. This subclass covers features of control systems or elements for regulating specific variables, which are clearly more generally applicable.
2. This subclass does not cover :
  - a. systems for controlling or regulating non-electric variables in general, which are covered by subclass G05D;
  - b. systems for regulating electric or magnetic variables in general, which are covered by subclass G05F;
  - c. systems specially adapted for the control of particular machines or apparatus provided for in a single other subclass, which are classified in the relevant subclass for such machines or apparatus, provided that there is specific provision for control or regulation relevant to the special adaptation (see Note (5), below). Otherwise, classification is made in the most appropriate place in this subclass.
3. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "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;
  - "electric" includes "electromechanical", "electrohydraulic" or "electropneumatic".
4. In this subclass, details of specific control systems are classified in the group relevant to the system, if not otherwise provided for.
5. This Note lists places in the IPC where there is specific provision of the kind referred to in Note (2)(c), above; where such provision is at a general level, the places are listed under the heading "General references"; where the provision is related to programme control, the places are listed under the heading "Places related to group G05B 19/00".

#### General references

A01K 73/04.....Spreading or positioning of drawn nets for fishing  
 A61G 13/02.....  
 A61G 15/02.....Adjustable operating tables, operating chairs, or dental chairs  
 B01D 3/42.....Distillation  
 B01D 24/48.....  
 B01D 29/60.....  
 B01D 37/04.....  
 B01D 46/44.....Filtration  
 B01D 53/30.....Separation of gases or vapours by gas-analysis apparatus  
 B01D 61/00.....Separation using semi-permeable membranes  
 B01J 4/00.....Feed or outlet in chemical or physical processes  
 B01J 38/14.....Oxygen content in oxidation gas for regeneration or reactivation of catalysts  
 B01J 47/14.....Ion-exchange processes  
 B05B 12/02.....Delivery in spraying systems  
 B21B 37/00.....  
 B21B 39/00.....Metal-rolling mills  
 B21K 31/00.....Positioning tool carriers for forging, pressing or hammering  
 B22D 11/16.....Continuous casting of metals  
 B22D 13/12.....Centrifugal casting of metals  
 B22D 17/32.....Pressure or injection die casting of metals  
 B22D 18/08.....Pressure or vacuum casting of metals  
 B22D 46/00.....Casting of metals in general  
 B23B 39/26.....Tool or work positioning for boring or drilling  
 B23D 36/00.....Machines for shearing or similar cutting stock travelling otherwise than in the direction of the cut  
 B23Q 5/00.....Driving or feeding mechanisms of machine tools  
 B23Q 15/00.....Feed movement, cutting velocity or position of machine tools  
 B23Q 35/00.....Copying from a pattern or master model for machine tools  
 B24B 47/22.....Position of grinding tool or work  
 B25J 13/00.....Manipulators  
 B26D 5/02.....Position of cutters in cutting machines  
 B29C 39/00to.....  
 B29C 51/00.....Shaping techniques for plastic substances  
 B30B 15/14.....

B30B 15/16.....	Presses
B41B 27/00.....	Composing machines
B41F 33/00.....	Printing machines or presses
B41J 11/42.....	Feeding sheets or webs in typewriters
B41L 39/00.....	Apparatus or devices for manifolding, duplicating or printing for commercial purposes
B41L 47/56.....	Addressing machines
B60G 17/00to.....	
B60G 21/00.....	Vehicle suspension
B60T 7/00to.....	
B60T 15/00.....	Vehicle brakes
B65B 57/00.....	Machines for packaging
B65G 43/00.....	Conveyors
E02F 3/43.....	Sequence of drive operations for dredging or soil-shifting
E21B 44/00.....	Earth drilling operations
F01K 1/12.....	
F01K 1/16.....	Steam accumulators
F01K 3/00.....	
F01K 7/00.....	
F01K 13/02.....	Steam engine plants
F02C 7/05.....	Air intakes for gas-turbine or jet-propulsion plants
F02C 9/00.....	Gas-turbine plants; Fuel supply in air-breathing jet-propulsion plants
F02D.....	Combustion engines
F02K 1/15.....	
F02K 1/76.....	Jet pipes or nozzles in jet-propulsion plants
F02K 7/00to.....	
F02K 9/00.....	Jet-propulsion plants
F04B 1/00.....	
F04B 27/00.....	
F04B 49/00.....	Positive-displacement machines
F04D 15/00.....	
F04D 27/00.....	Non-positive-displacement pumps, pumping installations, or systems
F16D 43/00.....	
F16D 48/00.....	Clutches
F16F 15/02.....	Suppression of vibrations using fluid means
F16H 59/00to.....	
F16H 63/00.....	Gearings
F22B 35/00.....	Steam boilers
F23G 5/50.....	Incineration of waste
F23N.....	Combustion in combustion apparatus
F24B 1/18.....	Combustion in open fires using solid fuel
F24J 2/40.....	Solar heating
F26B 25/22.....	Drying processes of solid materials or objects
F28B 11/00.....	Steam or vapour condensers
F28D 15/06.....	Heat-exchange apparatus with intermediate heat-transfer medium in closed tubes passing into or through conduit walls, in which the medium condenses and evaporates
F28F 27/00.....	Heat-exchanges or heat-transfer apparatus in general
G06F 11/00.....	Computers
G08G.....	Traffic
G09G.....	Indicating devices using static means to present variable information
G11B 15/00.....	
G11B 19/00.....	Driving, starting or stopping of record carriers
G21C 7/00.....	Nuclear reaction
G21D 3/00.....	Nuclear power plant
H01J 37/30.....	Electron-beam or ion-beam tubes used for localised treatment of objects
H02P.....	Electric motors, generators, or dynamo-electric converters
<u>Places related to group G05B 19/00(programme-control systems)</u>	
A61J 7/04.....	Programmed medicine dispensers
A61L 2/24.....	Disinfection or sterilising
A61N 1/36.....	Heart pace-makers
A63H 17/39.....	Steering-mechanisms for toy vehicles
B04B 13/00.....	Centrifuges
B21B 37/24.....	Thickness of work produced by metal-rolling mills
B21D 7/12.....	Bending metal rods, profiles, or tubes
B23B 39/08.....	
B23B 39/24.....	Boring or drilling machines
B23H 7/20.....	Electrical discharge or electrochemical machining
B23P 21/00.....	Assembling of parts to compose units
B24B 51/00.....	Series of individual steps in grinding a workpiece
B25J 9/00.....	Manipulators
B30B 15/26.....	Presses
B41F 33/16.....	Sequence of operations in printing machines or presses

B41J 11/44.....	Feeding sheets or webs in typewriters
B41L 39/16.....	Sequence of operations in apparatus or devices for manifolding, duplicating or printing for commercial purposes
B41L 47/64.....	Selecting text or image to be printed in addressing machines
B60L 15/20.....	Traction-motor speed of electrically-propelled vehicles
B65H 31/24.....	Piling articles
B66C 13/48.....	
B66C 23/58.....	Crane drives
B67D 7/14.....	Dispensing, delivering or transferring liquids
D05B 19/00.....	
D05B 21/00.....	Sewing machines
D05C 5/04.....	Embroidering machines
D06F 33/00.....	Operations in washing machines
F02D 27/02.....	
F02D 28/00.....	Combustion engines
F02D 41/26.....	Supply of combustible mixture or its constituents to combustion engines
F15B 21/02.....	Fluid-pressure actuator systems
F23N 5/20.....	
F23N 5/22.....	Combustion in combustion apparatus
G01G 19/38.....	Weighing apparatus
G04C 23/08.....	
G04C 23/34.....	Electromechanical clocks or watches
G06C 21/00.....	Mechanically operating digital computers
G06F 9/00.....	Control units for electric digital data processing
G06F 13/10.....	Peripheral devices for electric digital data processing
G06F 15/00.....	Electrically operating digital computers
G06G 7/06.....	Electrically or magnetically operating analogue computers
G09B 7/04.....	
G09B 7/08.....	
G09B 7/12.....	Electrically-operated teaching apparatus or devices
H01H 43/00.....	Electric switches
H01J 37/30.....	Electron-beam or ion-beam tubes used for localised treatment of objects
H03K 17/296.....	Electronic switching or gating
H04Q 3/54.....	Selecting arrangements in electric communication technique

### Subclass index

#### CONTROL SYSTEMS

Adaptive.....	13/00
Controlled by computer.....	15/00
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Controlled by programme.....	19/00
Involving sampling.....	21/00
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#### SYSTEM DETAILS

Comparing elements.....	1/00
Anti-hunting arrangements.....	5/00
Internal feedback arrangements.....	6/00
Obtaining smooth engagement or disengagement of automatic control.....	7/00
Safety arrangements.....	9/00
Automatic controllers.....	11/00

#### TESTING, MONITORING.....23/00

#### SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

<b>1/00</b>	<b>Comparing elements, i.e. elements for effecting comparison directly or indirectly between a desired value and existing or anticipated values</b> (comparing phase or frequency of two electric signals H03D 13/00)	5/01	• electric
		5/04	• fluidic [2]
1/01	• electric [2]	<b>6/00</b>	<b>Internal feedback arrangements for obtaining particular characteristics, e.g. proportional, integral, differential</b> (in automatic controllers G05B 11/00)
1/02	• • for comparing analogue signals [2]	6/02	• electric
1/03	• • for comparing digital signals [2]	6/05	• fluidic [2]
1/04	• • with sensing of the position of the pointer of a measuring instrument	<b>7/00</b>	<b>Arrangements for obtaining smooth engagement or disengagement of automatic control</b>
1/06	• • • continuous sensing	7/02	• electric [2]
1/08	• • • stepwise sensing	7/04	• fluidic [2]
1/11	• fluidic [2]		
<b>5/00</b>	<b>Anti-hunting arrangements</b>		

<b>9/00</b>	<b>Safety arrangements</b> (G05B 7/00 takes precedence; safety arrangements in programme-control systems G05B 19/048, G05B 19/406; safety valves F16K 17/00; emergency protective circuit arrangements in general H02H)	<b>17/00</b>	<b>Systems involving the use of models or simulators of said systems</b> (G05B 13/00, G05B 15/00, G05B 19/00 take precedence; analogue computers for specific processes, systems or devices, e.g. simulators, G06G 7/48) [3]
9/02	• electric	17/02	• electric
9/03	• • with multiple-channel loop, i.e. redundant control systems [2]	<b>19/00</b>	<b>Programme-control systems</b> (specific applications, <u>see</u> the relevant places, e.g. A47L 15/46; clocks with attached or built-in means operating any device at a preselected time interval G04C 23/00; marking or sensing record carriers with digital information G06K; information storage G11; time or time-programme switches which automatically terminate their operation after the programme is completed H01H 43/00)
9/05	• fluidic [2]	19/02	• electric
<b>11/00</b>	<b>Automatic controllers</b> (G05B 13/00 takes precedence)	19/04	• • Programme control other than numerical control, i.e. in sequence controllers or logic controllers (G05B 19/418 takes precedence; numerical control G05B 19/18)
11/01	• electric	19/042	• • • using digital processors (G05B 19/05 takes precedence) [6]
11/06	• • in which the output signal represents a continuous function of the deviation from the desired value, i.e. continuous controllers (G05B 11/26 takes precedence)	19/045	• • • using logic state machines, consisting only of a memory or a programmable logic device containing the logic for the controlled machine and in which the state of its outputs is dependent on the state of its inputs or part of its own output states, e.g. binary decision controllers, finite state controllers [6]
11/10	• • • the signal transmitted being dc	19/048	• • • Monitoring; Safety [6]
11/12	• • • the signal transmitted being modulated on an ac carrier	19/05	• • • Programmable logic controllers, e.g. simulating logic interconnections of signals according to ladder diagrams or function charts [5]
11/14	• • in which the output signal represents a discontinuous function of the deviation from the desired value, i.e. discontinuous controllers (G05B 11/26 takes precedence)	19/06	• • • using cams, discs, rods, drums, or the like (mechanical programme-control apparatus G05G 21/00)
11/16	• • • Two-step controllers, e.g. with on/off action	19/07	• • • where the programme is defined in the fixed connection of electrical elements, e.g. potentiometers, counters, transistors [6]
11/18	• • • Multi-step controllers	19/08	• • • using plugboards, cross-bar distributors, matrix switches, or the like
11/26	• • in which the output signal is a pulse-train	19/10	• • • using selector switches
11/28	• • • using pulse-height modulation; using pulse-width modulation	19/12	• • • using record carriers
11/30	• • • using pulse-frequency modulation	19/14	• • • • using punched cards or tapes
11/32	• • with inputs from more than one sensing element; with outputs to more than one correcting element	19/16	• • • • using magnetic record carriers
11/36	• • with provision for obtaining particular characteristics, e.g. proportional, integral, differential	19/18	• • Numerical control (NC), i.e. automatically operating machines, in particular machine tools, e.g. in a manufacturing environment, so as to execute positioning, movement or co-ordinated operations by means of programme data in numerical form (G05B 19/418 takes precedence) [6]
11/38	• • • for obtaining a proportional characteristic	19/19	• • • characterised by positioning or contouring control systems, e.g. to control position from one programmed point to another or to control movement along a programmed continuous path [3, 6]
11/40	• • • for obtaining an integral characteristic		
11/42	• • • for obtaining a characteristic which is both proportional and time-dependent, e.g. P. I., P. I. D.		
11/44	• pneumatic only		
11/46	• • without auxiliary power		
11/48	• • with auxiliary power		
11/50	• • • in which the output signal represents a continuous function of the deviation from the desired value, i.e. continuous controllers		
11/52	• • • in which the output signal represents a discontinuous function of the deviation from the desired value, i.e. discontinuous controllers		
11/54	• • • • Two-step controllers, e.g. with on/off action		
11/56	• • • • Multi-step controllers		
11/58	• • with inputs from more than one sensing element; with outputs to more than one correcting element		
11/60	• hydraulic only		
<b>13/00</b>	<b>Adaptive control systems, i.e. systems automatically adjusting themselves to have a performance which is optimum according to some preassigned criterion</b> (G05B 19/00 takes precedence; details of the computer G06F 15/18) [3]		
13/02	• electric		
13/04	• • involving the use of models or simulators [3]		
<b>15/00</b>	<b>Systems controlled by a computer</b> (G05B 13/00, G05B 19/00 take precedence; automatic controllers with particular characteristics G05B 11/00; computers <u>per se</u> G06) [3]		
15/02	• electric		
		<b>Note(s)</b>	In this group, the measuring system for an axis is used to measure the displacement along that axis. This measurement is used as position-feedback in the servo-control system.
		19/21	• • • • using an incremental digital measuring device [3]
		19/23	• • • • for point-to-point control [3]
		19/25	• • • • for continuous-path control [3]

- 19/27 • • • • using an absolute digital measuring device [3]
- 19/29 • • • • • for point-to-point control [3]
- 19/31 • • • • • for continuous-path control [3]
- 19/33 • • • • • using an analogue measuring device [3]
- 19/35 • • • • • for point-to-point control [3]
- 19/37 • • • • • for continuous-path control [3]
- 19/39 • • • • using a combination of the means covered by at least two of the preceding groups G05B 19/21, G05B 19/27 and G05B 19/33 [3]
- 19/40 • • • • Open loop systems, e.g. using stepping motor [3]
- 19/401 • • • • characterised by control arrangements for measuring, e.g. calibration and initialisation, measuring workpiece for machining purposes (G05B 19/19 takes precedence) [6]
- 19/402 • • • • characterised by control arrangements for positioning, e.g. centring a tool relative to a hole in the workpiece, additional detection means to correct position (G05B 19/19 takes precedence) [6]
- 19/404 • • • • characterised by control arrangements for compensation, e.g. for backlash, overshoot, tool offset, tool wear, temperature, machine construction errors, load, inertia (G05B 19/19, G05B 19/41 take precedence) [6]
- 19/406 • • • • characterised by monitoring or safety (G05B 19/19 takes precedence) [6]
- 19/4061 • • • • • Avoiding collision or forbidden zones [6]
- 19/4062 • • • • • Monitoring servoloop, e.g. overload of servomotor, loss of feedback or reference [6]
- 19/4063 • • • • • Monitoring general control system (G05B 19/4062 takes precedence) [6]
- 19/4065 • • • • • Monitoring tool breakage, life or condition [6]
- 19/4067 • • • • • Restoring data or position after power failure or other interruption [6]
- 19/4068 • • • • • Verifying part programme on screen, by drawing or other means [6]
- 19/4069 • • • • • Simulating machining process on screen (G05B 19/4068 takes precedence) [6]
- 19/408 • • • • characterised by data handling or data format, e.g. reading, buffering or conversion of data [6]
- 19/409 • • • • characterised by using manual data input (MDI) or by using control panel, e.g. controlling functions with the panel; characterised by control panel details, by setting parameters (G05B 19/408, G05B 19/4093 take precedence) [6]
- 19/4093 • • • • characterised by part programming, e.g. entry of geometrical information as taken from a technical drawing, combining this with machining and material information to obtain control information, named part programme, for the NC machine [6]
- 19/4097 • • • • characterised by using design data to control NC machines, e.g. CAD/CAM (G05B 19/4093 takes precedence; CAD in general G06F 17/50) [6]
- 19/4099 • • • • • Surface or curve machining, making 3D objects, e.g. desktop manufacturing [6]
- 19/41 • • • • characterised by interpolation, e.g. the computation of intermediate points between programmed end points to define the path to be followed and the rate of travel along that path (G05B 19/25, G05B 19/31, G05B 19/37, G05B 19/39, G05B 19/40 take precedence) [3, 6]
- 19/4103 • • • • • Digital interpolation [6]
- 19/4105 • • • • • Analog interpolation [6]
- 19/414 • • • • Structure of the control system, e.g. common controller or multiprocessor systems, interface to servo, programmable interface controller [6]
- 19/4155 • • • • characterised by programme execution, i.e. part programme or machine function execution, e.g. selection of a programme [6]
- 19/416 • • • • characterised by control of velocity, acceleration or deceleration (G05B 19/19 takes precedence) [6]
- 19/418 • • • • Total factory control, i.e. centrally controlling a plurality of machines, e.g. direct or distributed numerical control (DNC), flexible manufacturing systems (FMS), integrated manufacturing systems (IMS), computer integrated manufacturing (CIM) [6]
- 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
- 19/421 • • • • Teaching successive positions by mechanical means, e.g. by mechanically-coupled handwheels to position tool head or end effector (G05B 19/423 takes precedence) [6]
- 19/423 • • • • Teaching successive positions by walk-through, i.e. the tool head or end effector being grasped and guided directly, with or without servo-assistance, to follow a path [6]
- 19/425 • • • • Teaching successive positions by numerical control, i.e. commands being entered to control the positioning servo of the tool head or end effector [6]
- 19/427 • • • • Teaching successive positions by tracking the position of a joystick or handle to control the positioning servo of the tool head, master-slave control (G05B 19/423 takes precedence) [6]
- 19/43 • • • • fluidic [3]
- 19/44 • • • • pneumatic [3]
- 19/46 • • • • hydraulic [3]
- 21/00 Systems involving sampling of the variable controlled** (G05B 13/00-G05B 19/00 take precedence; transmission systems for measured values G08C; electronic switching or gating H03K 17/00)
- 21/02 • • • • electric
- 23/00 Testing or monitoring of control systems or parts thereof** (monitoring of programme-control systems G05B 19/048, G05B 19/406)
- 23/02 • • • • Electric testing or monitoring
- 24/00 Open-loop automatic control systems not otherwise provided for [2]**
- 24/02 • • • • electric [2]
- 24/04 • • • • fluidic [2]
- 99/00 Subject matter not provided for in other groups of this subclass [2006.01]**

**G05D SYSTEMS FOR CONTROLLING OR REGULATING NON-ELECTRIC VARIABLES** (for continuous casting of metals B22D 11/16; valves per se F16K; sensing non-electric variables, see the relevant subclasses of G01; for regulating electric or magnetic variables G05F)

### Note(s)

1. This subclass does not cover features of general applicability to regulating systems, e.g. anti-hunting arrangements, which are covered by subclass G05B.
2. In this subclass, the following term is used with the meaning indicated:
  - "systems" includes self-contained devices such as speed governors, pressure regulators.
3. Control systems specially adapted for particular apparatus, machines or processes are classified in the subclasses for the apparatus, machines or processes, provided that there is specific provision for control or regulation relevant to the special adaptation, either at a detailed level (e.g. A21B 1/40: "for regulating temperature in bakers' ovens") or at a general level (e.g. B23K 9/095: "for automatic control of welding parameters in arc welding"). Otherwise, classification is made in the most appropriate place in this subclass. The following are lists of places where there is specific provision of the kind referred to above. Where such provision is at a detailed level, the places have been grouped according to the main groups of this subclass. Where the provision is at a general level (e.g. of a kind appropriate to more than one of the main groups specified in the lists, or to main groups G05D 27/00 or G05D 29/00), the places are listed under the title "General References".

#### Places related to

A01B 69/00.....Agricultural machines or implements  
 A63H 17/36.....Toy vehicles  
 B60V 1/11.....Air-cushion vehicles  
 B60W 30/10.....Road vehicle path control  
 B62D 1/00.....Steering controls of motor vehicles or trailers, i.e. means for initiating a change of direction  
 B62D 6/00.....Arrangements for automatically controlling the steering depending on driving conditions  
 B62D 55/116.....Chassis of endless-tracked vehicles  
 B63H 25/00.....Marine steering; control of waterborne vessels  
 B64C 13/00-B64C 15/00.....Controlling aircraft  
 B64D 25/11.....Controlling attitude or direction of aircraft ejector seats  
 B64G 1/24.....Cosmonautic vehicles  
 F41G 7/00.....Self-propelled missiles  
 F42B 15/01.....Guided missiles  
 F42B 19/01.....Marine torpedoes

#### Places related to

A43D 119/00.....Footwear manufacture  
 B21K 31/00.....Tool carriers in forging or pressing  
 B23B 39/26.....Pattern-controlled boring or drilling tools  
 B23D 1/30, B23D 3/06, B23D 5/04 Planing or slotting machines controlled by copying device  
 B23H 7/18.....Electrode to workpiece spacing in electric discharge and electrochemical machining  
 B23K 26/02.....Workpiece in laser welding or cutting  
 B23K 37/04.....Workpiece in welding  
 B23K 37/06.....Molten metal in welding  
 B23Q 5/20.....Spindles in machine tools  
 B23Q 15/00, B23Q 16/00.....Tool or work position in machine tools  
 B23Q 35/00.....Tools controlled by pattern or master model  
 B24B 17/00.....Grinding controlled by patterns, drawings, magnetic tape or the like  
 B24B 47/22.....Starting position in grinding  
 B30B 15/24.....Actuating members in presses  
 B62D 55/116.....Chassis of tracked vehicles  
 B65H 23/18.....Web-advancing mechanisms  
 E02F 3/43.....Dippers or buckets in dredgers  
 F15B 9/00.....Fluid-pressure servomotors with follow-up action  
 F24J 2/38.....Tracking of solar heat collectors  
 G03F 9/00.....Photomechanical production of patterned or textured surfaces  
 G11B 5/588.....Rotating heads in information storage systems  
 G21C 7/12.....Movement of control elements in nuclear reactors

#### Places related to

A24B 7/14.....Tobacco cutting  
 B05C 11/02.....Thickness of coating of fluent material on surface  
 B21B 37/16.....Thickness, width, diameter or other transverse dimensions of the products of metal-rolling mills  
 C03B 18/04.....Dimension of glass ribbon  
 D21F 7/06.....Thickness of layer in paper making

#### Places related to

A45D 20/26.....Air in hair drying helmets  
 A61M 5/168.....Flow of media to the human body  
 B03C 3/36.....Gases or vapour in electrostatic separators  
 B05C 11/10.....Fluent material in coating devices  
 B67D 1/12.....Dispensing beverages on draught  
 B67D 7/28.....Transferring liquids

C10K 1/28.....Gas purifiers  
 E21B 21/08.....Flushing boreholes  
 E21B 43/12.....Obtaining liquids from wells  
 F01D 17/00.....Flow in non-positive-displacement machines or systems  
 F01M 1/16.....Lubrication arrangements  
 F01P 7/00.....Coolant flow in cooling devices  
 F02C 9/16, F02C 9/50.....Gas-turbine working fluid  
 F16L 55/027.....Throttle passages in pipes  
 F24F 11/00.....Air-flow or supply of heating or cooling fluids in air treatment arrangements  
 F26B 21/12.....Air or gas flow in dryers  
 G01G 11/08.....Continuous flow weighing apparatus  
 G21D 3/14.....Coolant in nuclear power plant

Places related to

B01D 21/34.....Liquid level in sedimentation arrangements  
 B41L 27/04.....Ink level in printing, manifolding or duplicating arrangements  
 F22D 5/00.....Feed water for boilers  
 H01J 1/10, H01J 13/14.....Liquid pool electrodes in electric discharge tubes or lamps

Places related to

B01D 21/32.....Density in sedimentation arrangements  
 B01F 15/04.....Mixers  
 B24C 7/00.....Abrasive blasts  
 B28C 7/00.....Mixtures of clays or cements  
 B65G 53/66.....Bulk material conveyors  
 F02K 3/075.....Flow ratio in jet-propulsion plants

Places related to

B21C 1/12.....Drum speed in metal drawing  
 B23Q 15/00.....Cutting velocity of tool or work  
 B30B 15/20.....Ram speed in presses  
 B60K 31/00.....Setting or limiting speed of vehicles  
 B60L 15/00.....Electrically-propelled vehicles  
 B60W 30/14.....Road vehicle cruise control  
 B64D 31/08.....Cruising speed of aircraft  
 D01D 1/09.....Feed rate in manufacture of artificial filaments, threads, fibres, bristles or ribbons  
 D01G 15/36.....Carding machines  
 D02H 13/14.....Warping, beaming or leasing machines  
 D03D 51/16.....Cyclically varying speed of looms  
 G01N 30/32.....Speed of fluid carrier in chemical analysis  
 G11B 15/46.....Filamentary or web record carriers or heads for such carriers in information storage systems  
 G11B 19/28.....Non-filamentary, non-web record carriers, or heads for such carriers in information storage systems

Places related to

B25D 9/26.....Portable percussive tools  
 B30B 15/22.....Ram pressure in presses  
 B65H 59/00.....Tension in filamentary material  
 B65H 77/00.....Tension in webs, tapes, filamentary material  
 B66D 1/50.....Rope, cable or chain tension  
 D03D 49/04.....Tension in looms  
 D05B 47/04.....Tension in sewing machines  
 D21F 3/06.....Pressure in paper-making machines  
 F26B 13/12.....Drying fabrics  
 F26B 21/10.....Pressure in dryers  
 G11B 15/43.....Record carrier tension in information storage arrangements

Places related to

B60C 23/00.....Tyre pressure  
 B63C 11/08.....Air within diving suit  
 B64D 13/00.....Aircraft air-pressure  
 B65G 53/66.....Bulk material conveyors  
 D01D 1/09.....Manufacture of artificial filaments, threads, fibres, bristles or ribbons  
 E21B 21/08.....Flushing boreholes  
 F01M 1/16.....Lubrication arrangements  
 G01N 30/32.....Pressure of fluid carrier in chemical analysis  
 H01J 7/14.....Pressure in electric discharge tubes or lamps  
 H01K 1/52.....Pressure in electric incandescent lamps

Places related to

B25D 9/26.....Portable percussion tools  
 B65G 27/32.....Jigging conveyors

Places related to

B01D 21/32.....Density in sedimentation arrangements  
 B01D 53/30.....Treating gases or vapours  
 G01N 30/34.....Composition of fluid carrier in chemical analysis

Places related to

A01G 25/16.....Watering gardens, fields, sports grounds or the like

A01K 41/04.....Poultry incubators  
 A24B 9/00.....Tobacco products  
 F24F 11/00.....Air conditioning  
 F26B 21/08.....Dryers

Places related to

A21B 1/40.....Bakers' ovens  
 A45D 6/20.....Hair curlers  
 B21C 31/00.....Metal extruding  
 B60C 23/00.....Tyre temperature  
 B64G 1/50.....Cosmonautic vehicles  
 C03B 18/18, C03B 18/22.....Float baths in glass making  
 D01D 1/09.....Manufacture of artificial filaments, threads, fibres, bristles or ribbons  
 D04B 35/30.....Knitting machines  
 D06F 75/26.....Hand irons  
 D21F 5/06.....Paper-making machines  
 F01M 5/00.....Lubricant in lubrication arrangements  
 F16N 7/08.....Arrangements for supplying oil or unspecified lubricant from a reservoir  
 F22G 5/00.....Steam superheat  
 F26B 21/10.....Dryers  
 G01N 30/30.....Temperature of fluid carrier in chemical analysis  
 H01M 10/60.....Electric storage cells  
 H05B 6/06, H05B 6/50, H05B 6/68 Dielectric, induction or microwave heating  
 H05G 1/36.....Anode of X-ray tube

Places related to

B41B 21/08.....Photographic composing machines  
 H01S 3/10, H05B 33/08, H05B 35/00-H05B 43/00 Lasers and other light sources

General references

A01D 41/127.....Combines  
 A01J 5/007.....Milking machines  
 B23K 9/095.....Welding parameters  
 B23Q 35/00.....Copying  
 B24B 17/00, B24B 49/00.....Grinding or polishing  
 B24C 7/00.....Abrasive blasts  
 B67D 1/12.....Dispensing beverages on draught  
 F23C 10/28.....Combustion apparatus in which combustion takes place in a fluidised bed of fuel or other particles  
 G03G 21/20.....Electrographic, electrophotographic or magnetographic processes  
 H02P 5/00-H02P 9/00.....Dynamo-electric motors or generators

Subclass index

CONTROL OF: SPEED OR ACCELERATION; FORCE; PRESSURE; POWER; MECHANICAL

OSCILLATIONS.....13/00, 15/00, 16/00, 17/00, 19/00

CONTROL OF: FLOW; LEVEL; RATIO.....7/00, 9/00, 11/00

CONTROL OF: TEMPERATURE; HUMIDITY; VISCOSITY; CHEMICAL OR PHYSICO-CHEMICAL

VARIABLES; LIGHT INTENSITY.....23/00, 22/00, 24/00, 21/00, 25/00

CONTROL OF: POSITION, DIRECTION, DIMENSIONS.....1/00-5/00

SIMULTANEOUS CONTROL OF TWO OR MORE VARIABLES.....27/00, 29/00

SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

**1/00 Control of position, course, altitude, or attitude of land, water, air, or space vehicles, e.g. automatic pilot**  
 (radio navigation systems or analogous systems using other waves G01S)

1/02 • Control of position or course in two dimensions [2]

1/03 • • using near-field transmission systems, e.g. inductive-loop type

1/04 • Control of altitude or depth

1/06 • • Rate of change of altitude or depth

1/08 • Control of attitude, i.e. control of roll, pitch, or yaw

1/10 • Simultaneous control of position or course in three dimensions (G05D 1/12 takes precedence)

1/12 • Target-seeking control

**3/00 Control of position or direction** (G05D 1/00 takes precedence; for numerical control G05B 19/18)

3/10 • without using feedback [3]

3/12 • using feedback [3]

3/14 • • using an analogue comparing device [3]

3/16 • • • whose output amplitude can only take a number of discrete values (G05D 3/18 takes precedence) [3]

3/18 • • • delivering a series of pulses [3]

3/20 • • using a digital comparing device [3]

**5/00 Control of dimensions of material**

5/02 • of thickness, e.g. of rolled material

5/03 • • characterised by the use of electric means

5/04 • of the size of items, e.g. of particles

5/06 • • characterised by the use of electric means

**7/00 Control of flow** (level control G05D 9/00; ratio control G05D 11/00; weighing apparatus G01G)

7/01 • without auxiliary power

7/03 • with auxiliary non-electric power [2]

7/06 • characterised by the use of electric means

9/00	<b>Level control, e.g. controlling quantity of material stored in vessel</b>	13/38	• • • involving centrifugal governors of fly-weight type
9/02	• without auxiliary power	13/40	• • • involving centrifugal governors of pump type
9/04	• with auxiliary non-electric power [2]	13/42	• • • involving fluid governors of flow-controller type, i.e. the width of liquid flow being controlled by fly-weights
9/12	• characterised by the use of electric means		
11/00	<b>Ratio control</b> (control of chemical or physico-chemical variables, e.g. pH-value, G05D 21/00; humidity control G05D 22/00; control of viscosity G05D 24/00) [3]	13/44	• • • involving fluid governors of jet type
11/02	• Controlling ratio of two or more flows of fluid or fluent material	13/46	• • using regulating devices with proportional band and integral action, i.e. P.I. regulating devices
11/03	• • without auxiliary power	13/48	• • • involving resilient restoring mechanisms
11/035	• • with auxiliary non-electric power [2]	13/50	• • • involving connecting means for superimposing a proportional regulating device and an integral regulating device
11/04	• • • by sensing weight of individual components, e.g. gravimetric procedure	13/52	• • using regulating devices with proportional band and derivative action, i.e. P.D. regulating devices
11/06	• • • by sensing density of mixture, e.g. using aerometer	13/54	• • • involving centrifugal governors of fly-weight type exerting an acceleratory effect
11/08	• • • by sensing concentration of mixture, e.g. by measuring pH-value [3]	13/56	• • • involving restoring mechanisms exerting a delay effect
11/10	• • • • by sensing moisture of non-aqueous liquids	13/58	• • • involving means for connecting a speed-regulating device and an acceleration-regulating device
11/12	• • • by sensing viscosity of mixture	13/60	• • using regulating devices with proportional band, derivative, and integral action, i.e. P.I.D. regulating devices
11/13	• • characterised by the use of electric means	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
11/16	• Controlling mixing ratio of fluids having different temperatures, e.g. by sensing the temperature of a mixture of fluids having different viscosities	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
13/00	<b>Control of linear speed; Control of angular speed; Control of acceleration or deceleration, e.g. of a prime mover</b> (synchronising telegraph receiver and transmitter H04L 7/00)	13/66	• Governor units providing for co-operation with control dependent upon a variable other than speed
13/02	• Details	15/00	<b>Control of mechanical force or stress; Control of mechanical pressure</b>
13/04	• • providing for emergency tripping of an engine in case of exceeding maximum speed	15/01	• characterised by the use of electric means
13/06	• • providing for damping of erratic vibrations in governors	16/00	<b>Control of fluid pressure</b>
13/08	• without auxiliary power	16/02	• Modifications to reduce the effects of instability, e.g. due to vibrations, friction, abnormal temperature, overloading, unbalance (vibration-dampers F16F 7/00)
13/10	• • Centrifugal governors with fly-weights	16/04	• without auxiliary power
13/12	• • • Details	16/06	• • the sensing element being a flexible member yielding to pressure, e.g. diaphragm, bellows, capsule
13/14	• • • • Fly-weights; Mountings thereof; Adjusting equipment for limits, e.g. temporarily	16/08	• • • Control of liquid pressure
13/16	• • • • Risers; Transmission gear therefor; Restoring mechanisms therefor	16/10	• • the sensing element being a piston or plunger
13/18	• • • counterbalanced by spider springs acting immediately upon the fly-weights	16/12	• • the sensing element being a float
13/20	• • • counterbalanced by spider springs acting upon the articulated riser	16/14	• with auxiliary non-electric power [2]
13/22	• • • counterbalanced by fluid pressure acting upon the articulated riser	16/16	• • derived from the controlled fluid
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	16/18	• • derived from an external source
13/26	• • • with provision for modulating the degree of non-uniformity of speed	16/20	• characterised by the use of electric means
13/28	• • • with provision for performing braking effects in case of increased speed	17/00	<b>Control of torque; Control of mechanical power</b>
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 F15B 5/00)	17/02	• characterised by the use of electric means
13/32	• • • using a pump	19/00	<b>Control of mechanical oscillations, e.g. of amplitude, of frequency, of phase</b>
13/34	• with auxiliary non-electric power (fluid-pressure converters F15B 3/00) [2]	19/02	• characterised by the use of electric means
13/36	• • using regulating devices with proportional band, i.e. P. regulating devices	21/00	<b>Control of chemical or physico-chemical variables, e.g. pH-value [3]</b>
		21/02	• characterised by the use of electric means
		22/00	<b>Control of humidity [2]</b>

## G05D

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| <p>22/02 • characterised by the use of electric means</p> <p><b>23/00 Control of temperature</b> (automatic switching arrangements for electric heating apparatus H05B 1/02)</p> <p>23/01 • without auxiliary power</p> <p>23/02 • • with sensing element expanding and contracting in response to changes of temperature (G05D 23/13 takes precedence)</p> <p>23/08 • • • with bimetallic element (arrangement of valves and flow lines specially adapted for mixing fluid F16K 11/00)</p> <p>23/10 • • • • with snap-action elements (for valves F16K 31/56)</p> <p>23/12 • • with sensing element responsive to pressure or volume changes in a confined fluid</p> <p>23/13 • • by varying the mixing ratio of two fluids having different temperatures</p> <p>23/185 • with auxiliary non-electric power [2]</p> <p>23/19 • characterised by the use of electric means</p> <p>23/20 • • with sensing elements having variation of electric or magnetic properties with change of temperature (G05D 23/13 takes precedence)</p> <p>23/22 • • • the sensing element being a thermocouple</p> <p>23/24 • • • the sensing element having a resistance varying with temperature, e.g. thermistor</p> <p>23/26 • • • the sensing element having a permeability varying with temperature</p> <p>23/27 • • with sensing element responsive to radiation</p> <p>23/275 • • with sensing element expanding, contracting, or fusing in response to changes of temperature</p> | <p>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 G05B)</p> <p>23/32 • • • with provision for adjustment of the effect of the auxiliary heating device, e.g. as a function of time</p> <p><b>24/00 Control of viscosity</b></p> <p>24/02 • characterised by the use of electric means</p> <p><b>25/00 Control of light, e.g. intensity, colour, phase</b> (mechanically operable parts of lighting devices for the control of light F21V; optical devices or arrangements using movable or deformable elements for controlling light independent of the light source G02B 26/00; devices or arrangements, the optical operation of which is modified by changing the optical properties of the medium of the devices or arrangements for the control of light, circuit arrangements specially adapted therefor, control of light by electro-magnetic waves, electrons or other elementary particles G02F 1/00) [4]</p> <p>25/02 • characterised by the use of electric means</p> <p><b>27/00 Simultaneous control of variables covered by two or more of main groups G05D 1/00-G05D 25/00</b></p> <p>27/02 • characterised by the use of electric means</p> <p><b>29/00 Simultaneous control of electric and non-electric variables</b></p> <p><b>99/00 Subject matter not provided for in other groups of this subclass [2006.01]</b></p> |
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**G05F SYSTEMS FOR REGULATING ELECTRIC OR MAGNETIC VARIABLES** (regulating the timing or recurrence frequency of pulses in radar or radio navigation systems G01S; regulation of current or voltage, specially adapted for use in electronic time-pieces G04G 19/02; closed-loop systems for regulating non-electric variables by electric means G05D; regulating power supply of digital computers G06F 1/26; for obtaining desired operating characteristics of electromagnets with armatures H01F 7/18; regulating electric power distribution networks H02J; regulating the charging of batteries H02J 7/00; regulating of the output of static converters, e.g. switching regulators, H02M; regulation of the output of electric generators H02N, H02P 9/00; controlling transformers, reactors or choke coils H02P 13/00; regulating frequency response, gain, maximum output, amplitude or bandwidth of amplifiers H03G; regulating tuning of resonant circuits H03J; controlling generators of electronic oscillations or pulses H03L; regulating characteristics of transmission lines H04B; controlling electric light sources H05B 37/02, H05B 39/04, H05B 41/36; electric control of X-ray apparatus H05G 1/30) [4, 5]

### Note(s)

- This subclass covers:
  - systems only;
  - use of hydraulic, pneumatic, mechanical, and electrical motors for varying electric characteristics of devices which restore the quantity regulated;
  - the combination of static converters and current or voltage regulators, if the essential characteristic resides in the combination.
- This subclass does not cover elements per se, which are covered by the relevant subclasses.

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| <p><b>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</b></p> <p>1/02 • Regulating electric characteristics of arcs (arrangements for feeding or moving of electrodes for spot or seam welding or cutting B23K 9/12; arrangements for feeding electrodes for electric heating or electric lighting H05B 7/109, H05B 31/18; automatic control of power for heating by discharge H05B 7/148) [2]</p> | <p>1/04 • • by means of saturable magnetic devices</p> <p>1/06 • • by means of discharge tubes</p> <p>1/08 • • by means of semiconductor devices</p> <p>1/10 • Regulating voltage or current (G05F 1/02 takes precedence; for electric railways B60M 3/02)</p> <p>1/12 • • wherein the variable is actually regulated by the final control device is ac (G05F 1/625 takes precedence) [4]</p> <p>1/13 • • • using ferroresonant transformers as final control devices [4]</p> <p>1/14 • • • using tap transformers or tap changing inductors as final control devices [4]</p> |
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- 1/147 • • • • with motor driven tap switch [4]
- 1/153 • • • • • controlled by discharge tubes or semiconductor devices [4]
- 1/16 • • • • • combined with discharge tubes or semiconductor devices
- 1/20 • • • • • semiconductor devices only
- 1/22 • • • • • combined with separate magnetic control devices having a controllable degree of saturation
- 1/24 • • • • using bucking or boosting transformers as final control devices
- 1/247 • • • • • with motor in control circuit [4]
- 1/253 • • • • • the transformers including plural windings in series between source and load (G05F 1/247 takes precedence) [4]
- 1/26 • • • • • combined with discharge tubes or semiconductor devices
- 1/30 • • • • • semiconductor devices only
- 1/32 • • • • using magnetic devices having a controllable degree of saturation as final control devices
- 1/325 • • • • • with specific core structure, e.g. gap, aperture, slot, permanent magnet [4]
- 1/33 • • • • • with plural windings through which current to be controlled is conducted [4]
- 1/335 • • • • • on different cores [4]
- 1/34 • • • • • combined with discharge tubes or semiconductor devices
- 1/38 • • • • • semiconductor devices only
- 1/40 • • • • using discharge tubes or semiconductor devices as final control devices
- 1/42 • • • • • discharge tubes only
- 1/44 • • • • • semiconductor devices only
- 1/445 • • • • • being transistors in series with the load [3]
- 1/45 • • • • • being controlled rectifiers in series with the load [3]
- 1/455 • • • • • with phase control [3]
- 1/46 • • • wherein the variable actually regulated by the final control device is dc (G05F 1/625 takes precedence) [4]
- 1/52 • • • • using discharge tubes in series with the load as final control devices
- 1/54 • • • • • additionally controlled by the unregulated supply
- 1/56 • • • • using semiconductor devices in series with the load as final control devices
- 1/563 • • • • • including two stages of regulation, at least one of which is output level responsive, e.g. coarse and fine regulation [4]
- 1/565 • • • • • sensing a condition of the system or its load in addition to means responsive to deviations in the output of the system, e.g. current, voltage, power factor (G05F 1/563 takes precedence) [4]
- 1/567 • • • • • for temperature compensation [4]
- 1/569 • • • • • for protection [4]
- 1/571 • • • • • with overvoltage detector [4]
- 1/573 • • • • • with overcurrent detector [4]
- 1/575 • • • • • characterised by the feedback circuit [4]
- 1/577 • • • • • for plural loads [4]
- 1/585 • • • • • providing voltages of opposite polarities [4]
- 1/59 • • • • • including plural semiconductor devices as final control devices for a single load [4]
- 1/595 • • • • • semiconductor devices connected in series [4]
- 1/607 • • • • using discharge tubes in parallel with the load as final control devices [3]
- 1/61 • • • • • including two stages of regulation, at least one of which is output level responsive [4]
- 1/613 • • • • using semiconductor devices in parallel with the load as final control devices [3]
- 1/614 • • • • • including two stages of regulation, at least one of which is output level responsive [4]
- 1/618 • • • • using semiconductor devices in series and in parallel with the load as final control devices [4]
- 1/62 • • • • using bucking or boosting dc sources
- 1/625 • • • • wherein it is irrelevant whether the variable actually regulated is ac or dc [4]
- 1/63 • • • • using variable impedances in series with the load as final control devices [4]
- 1/635 • • • • • being Hall effect devices, magnetoresistors or thermistors [4]
- 1/644 • • • • • being pressure-sensitive resistors [4]
- 1/648 • • • • • being plural resistors among which a selection is made [4]
- 1/652 • • • • using variable impedances in parallel with the load as final control devices [4]
- 1/656 • • • • using variable impedances in series and in parallel with the load as final control devices [4]
- 1/66 • • • Regulating electric power
- 1/67 • • • to the maximum power available from a generator, e.g. from solar cell [4]
- 1/70 • • • Regulating power factor; Regulating reactive current or power [3]
- 3/00 Non-retroactive systems for regulating electric variables by using an uncontrolled element, or an uncontrolled combination of elements, such element or such combination having self-regulating properties**
- 3/02 • • • Regulating voltage or current
- 3/04 • • • wherein the variable is ac
- 3/06 • • • • using combinations of saturated and unsaturated inductive devices, e.g. combined with resonant circuit
- 3/08 • • • wherein the variable is dc
- 3/10 • • • • using uncontrolled devices with non-linear characteristics [4]
- 3/12 • • • • • being glow discharge tubes
- 3/16 • • • • • being semiconductor devices [3]
- 3/18 • • • • • using Zener diodes [3]
- 3/20 • • • • • using diode-transistor combinations (G05F 3/18 takes precedence) [3]
- 3/22 • • • • • wherein the transistors are of the bipolar type only (G05F 3/26, G05F 3/30 take precedence) [4]
- 3/24 • • • • • wherein the transistors are of the field-effect type only (G05F 3/26, G05F 3/30 take precedence) [4]
- 3/26 • • • • • Current mirrors [4]
- 3/28 • • • • • • combined with a non-linear current amplifier [4]
- 3/30 • • • • • • Regulators using the difference between the base-emitter voltages of two bipolar transistors operating at different current densities (G05F 3/26 takes precedence) [4]

## G05F

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| <p>5/00 <b>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</b></p> <p>5/02 • Phase controlled switching using electronic tubes or three or more terminal semiconductive devices [4]</p> | <p>5/04 • using a transformer or inductor as the final control device [4]</p> <p>5/06 • • saturable [4]</p> <p>5/08 • using a linearly acting final control device [4]</p> <p>7/00 <b>Regulating magnetic variables</b> (details of apparatus for measuring magnetic variables involving magnetic resonance G01R 33/28) [5]</p> |
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**G05G CONTROL DEVICES OR SYSTEMS INsofar AS CHARACTERISED BY MECHANICAL FEATURES ONLY** ("Bowden" or like mechanisms F16C 1/10; gearings or mechanisms not peculiar to this purpose F16H; speed changing or reversing mechanisms for gearings conveying rotary motion F16H 59/00-F16H 63/00)

### Note(s)

1. This subclass covers :
  - members of general applicability for mechanical control;
  - mechanical systems for moving members to one or more definite settings.
2. Systems peculiar to the control of particular machines or apparatus provided for in a single other class are classified in the relevant class for such machines or apparatus, for example:
  - A61G 13/02.....Controls for adjusting operating tables
  - A61G 15/02.....Controls for adjusting operating chairs
  - A63F 13/20, A63F 13/98.....Accessories for games using an electronically generated display
  - B25J.....Manipulators, e.g. controls therefor
  - B60K 26/00.....Arrangement or mounting of propulsion-unit control devices in vehicles
  - B60T 7/00.....Vehicle brake-action initiating means
  - B62D 33/073.....Adaptations of control devices for movable vehicle cabs
  - B62K 21/00.....Cycle-steering devices
  - B62K 23/00.....Rider-operated controls specially adapted for cycles
  - B62L 3/00.....Brake-actuating mechanisms specially adapted for cycles
  - B63H 25/02.....Marine steering initiating means
  - B66B 1/00.....Controls for elevators
  - B66C 13/18.....Control systems or devices for cranes
  - B66C 13/56.....Arrangements of handles or pedals for crane operation
  - E02F 9/20.....Control devices for dredging or soil shifting machines
  - F16C 3/28.....Adjustable cranks or eccentrics
  - F16D 43/00.....Automatic clutches
  - F16K 31/00, F16K 33/00.....Controls for valves
  - F16P 3/00.....Safety devices acting in conjunction with the control or operation of a machine
  - F16P 7/02.....Stopping machines on occurrence of dangerous conditions therein
  - G02B 21/32.....Micromanipulators structurally combined with microscopes
  - G04B 1/00-G04B 18/00.....Driving mechanisms in clocks or watches
  - G06C.....Digital computers in which all the computation is effected mechanically
  - G06F 3/01.....Manual computer input arrangements
  - G06K 11/00.....Converting a pattern of mechanical parameters into electric signals
  - G21C 7/08.....Displacement of solid control elements in nuclear reactors
  - H01H.....Mechanisms for operating switch contacts
  - H03J 1/00.....Mechanical control of resonant circuits.

### Subclass index

MANUALLY-ACTUATED CONTROL MECHANISMS, ONE OR MORE CONTROLLING MEMBERS  
 ACTUATING ONE OR MORE CONTROLLED MEMBERS.....7/00, 9/00, 11/00, 13/00  
 AUTOMATIC MOVEMENT-INITIATING DEVICES; TRIP MECHANISMS.....15/00, 17/00  
 SERVO-MECHANISMS.....19/00  
 PROGRAMME-CONTROL DEVICES.....21/00  
 LOCKING MEANS, LIMITING MEANS; POSITIONING MEANS.....5/00, 23/00  
 COMPONENT PARTS.....1/00, 3/00, 25/00

- 1/00 **Controlling members, e.g. knobs or handles; Assemblies or arrangements thereof; Indicating position of controlling members** (joysticks G05G 9/04; steering wheels for motor vehicles B62D) [2008.04]

### Note(s) [2008.04]

In this group the first place priority rule is applied, i.e. at each hierarchical level classification is made in the first appropriate place.

- 1/01 • Arrangements of two or more controlling members with respect to one another (double foot control, e.g. for instruction vehicles G05G 1/34; mounting units comprising an assembly with two or more pedals G05G 1/36) **[2008.04]**
- 1/015 • Arrangements for indicating the position of a controlling member (means for continuously detecting pedal position G05G 1/38; means for detecting position through tactile feedback G05G 5/03) **[2008.04]**
- 1/02 • Controlling members for hand-actuation by linear movement, e.g. push buttons **[1, 7]**
- 1/04 • Controlling members for hand-actuation by pivoting movement, e.g. levers **[1, 7]**
- 1/06 • • Details of their grip parts **[1, 7]**
- 1/08 • Controlling members for hand-actuation by rotary movement, e.g. hand wheels **[1, 7]**
- 1/10 • • Details, e.g. of discs, knobs, wheels or handles
- 1/12 • • • Means for securing the members on rotatable spindles or the like
- 1/30 • Controlling members actuated by foot **[2008.04]**
- 1/32 • • with means to prevent injury **[2008.04]**
- 1/323 • • • means disconnecting the connection between pedal and controlled member, e.g. by breaking or bending the connecting rod **[2008.04]**
- 1/327 • • • means disconnecting the pedal from its hinge or support, e.g. by breaking or bending the support **[2008.04]**
- 1/34 • • Double foot controls, e.g. for instruction vehicles **[2008.04]**
- 1/36 • • Mounting units comprising an assembly of two or more pedals, e.g. for facilitating mounting **[2008.04]**
- 1/38 • • comprising means to continuously detect pedal position **[2008.04]**
- 1/40 • • adjustable **[2008.04]**
- 1/405 • • • infinitely adjustable **[2008.04]**
- 1/42 • • non-pivoting, e.g. sliding **[2008.04]**
- 1/44 • • pivoting **[2008.04]**
- 1/445 • • • about a central fulcrum **[2008.04]**
- 1/46 • • Means, e.g. links, for connecting the pedal to the controlled unit **[2008.04]**
- 1/48 • • Non-slip pedal treads; Pedal extensions or attachments characterised by mechanical features only **[2008.04]**
- 1/483 • • • Non-slip treads **[2008.04]**
- 1/487 • • • Pedal extensions **[2008.04]**
- 1/50 • • Manufacturing of pedals; Pedals characterised by the material used **[2008.04]**
- 1/52 • Controlling members specially adapted for actuation by other parts of the human body than hand or foot **[2008.04]**
- 1/54 • Controlling members specially adapted for actuation by auxiliary operating members or extensions; Operating members or extensions therefor (pedal extensions G05G 1/487) **[2008.04]**
- 1/56 • • Controlling members specially adapted for actuation by keys, screwdrivers or like tools **[2008.04]**
- 1/58 • Rests or guides for relevant parts of the operator's body **[2008.04]**
- 1/60 • • Foot rests or foot guides **[2008.04]**
- 1/62 • • Arm rests **[2008.04]**
- 3/00 Controlled members (gear shifter yokes F16H 63/32); Assemblies or arrangements thereof (interlocking of controlled members G05G 5/08) [1, 7]**
- 5/00 Means for preventing, limiting or returning the movements of parts of a control mechanism, e.g. locking controlling member (G05G 17/00 takes precedence) [5]**
- 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 (G05G 5/28 takes precedence)
- 5/03 • Means for enhancing the operator's awareness of the arrival of the controlling member at a command or datum position; Providing feel, e.g. means for creating a counterforce (arrangements for indicating the position of the controlling member G05G 1/015) **[5, 2008.04]**
- 5/04 • Stops for limiting movement of members, e.g. adjustable stop (G05G 5/03, G05G 5/05, G05G 5/28 take precedence) **[5]**
- 5/05 • Means for returning or tending to return controlling members to an inoperative or neutral position, e.g. by providing return springs or resilient end-stops (G05G 5/28 takes precedence) **[5]**
- 5/06 • for holding members in one or a limited number of definite positions only (G05G 5/03, G05G 5/05, G05G 5/28 take precedence) **[5]**
- 5/08 • • Interlocking of members, e.g. locking a member in a particular position before or during the movement of another member
- 5/12 • for holding members in an indefinite number of positions, e.g. by a toothed quadrant (G05G 5/28 takes precedence) **[5]**
- 5/14 • • by locking a member with respect to a fixed quadrant, rod, or the like
- 5/16 • • • by friction
- 5/18 • • • by positive interengagement, e.g. by a pawl
- 5/20 • • by locking a quadrant, rod, or the like carried by the member
- 5/22 • • • by friction
- 5/24 • • • by positive interengagement, e.g. by a pawl
- 5/26 • • by other means than a quadrant, rod, or the like
- 5/28 • for preventing unauthorised access to the controlling member or its movement to a command position **[5]**
- 7/00 Manually-actuated control mechanisms provided with one single controlling member co-operating with one single controlled member; Details thereof (controlling members G05G 1/00)**
- 7/02 • characterised by special provisions for conveying or converting motion, or for acting at a distance
- 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
- 7/06 • • in which repeated movement of the controlling member produces increments of movement of the controlled member (G05G 7/08 takes precedence)
- 7/08 • • in which repeated movement of the controlling member moves the controlled member through a cycle of distinct positions
- 7/10 • • specially adapted for remote control (G05G 7/04-G05G 7/08 take precedence)
- 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
- 7/14 • characterised by means for delaying initiation of, or making more gradual throughout, the movement of the controlled member in response to a given input from the controlling member, e.g. by providing lost motion in the command train

## G05G

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| <p>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</p> <p><b>9/00 Manually-actuated control mechanisms provided with one single controlling member co-operating with two or more controlled members, e.g. selectively, simultaneously</b></p> <p>9/02 • the controlling member being movable in different independent ways, movement in each individual way actuating one controlled member only</p> <p>9/04 • • in which movement in two or more ways can occur simultaneously</p> <p>9/047 • • • the controlling member being movable by hand about orthogonal axes, e.g. joysticks [5]</p> <p>9/053 • • • the controlling member comprising a ball [5]</p> <p>9/06 • the controlled members being actuated successively by repeated movement of the controlling member</p> <p>9/08 • the controlled members being actuated successively by progressive movement of the controlling member</p> <p>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</p> <p><b>11/00 Manually-actuated control mechanisms provided with two or more controlling members co-operating with one single controlled member</b></p> <p><b>13/00 Manually-actuated control mechanisms provided with two or more controlling members and also two or more controlled members</b> (interlocking G05G 5/08)</p> | <p>13/02 • with separate controlling members for preselection and shifting of controlled members</p> <p><b>15/00 Mechanical devices for initiating a movement automatically due to a specific cause</b></p> <p>15/02 • due to alteration of the sense of movement of a member</p> <p>15/04 • due to distance or angle travelled by a member</p> <p>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 G01P)</p> <p>15/08 • due to the load or torque on a member, e.g. if exceeding a predetermined value thereof</p> <p><b>17/00 Mechanical devices for moving a member after being released; Trip or release mechanisms characterised thereby</b></p> <p><b>19/00 Servo-mechanisms with follow-up action, e.g. occurring in steps</b></p> <p><b>21/00 Mechanical apparatus for control of a series of operations, i.e. programme control, e.g. involving a set of cams</b> (G05G 5/02 takes precedence)</p> <p><b>23/00 Means for ensuring the correct positioning of parts of control mechanisms, e.g. for taking-up play</b></p> <p>23/02 • self-adjusting</p> <p><b>25/00 Other details, features or accessories of control mechanisms, e.g. supporting intermediate members elastically</b></p> <p>25/02 • Inhibiting the generation or transmission of noise [5]</p> <p>25/04 • Sealing against entry of dust, weather or the like [5]</p> |
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## G06 COMPUTING; CALCULATING; COUNTING

### Note(s)

1. This class covers :
  - simulators which are concerned with the mathematics of computing the existing or anticipated conditions within the real device or system;
  - simulators which demonstrate, by means involving computing, the function of apparatus or of a system, if no provision exists elsewhere;
  - image data processing or generation.
2. This class does not cover :
  - combinations of writing implements with computing devices, which are covered by group B43K 29/08;
  - control functions derived from simulators, in general, which are covered by class G05, although such functions may be covered by the subclass of this class for the device controlled;
  - measurement or analysis of an individual variable to serve as an input to a simulator, which is covered by class G01;
  - simulators regarded as teaching or training devices which is the case if they give perceptible sensations having a likeness to the sensations a student would experience in reality in response to actions taken by him. Such simulators are covered by class G09;
  - components of simulators, if identical with real devices or machines, which are covered by the relevant subclass for these devices or machines (and not by class G09).
3. In this class, the following terms or expressions are used with the meanings indicated:
  - "data" is used as the synonym of "information". Therefore, the term "information" is not used in subclasses G06C, G06F or G06Q;
  - "calculating or computing" includes, inter alia, operations on numerical values and on data expressed in numerical form. Of these terms "computing" is used throughout the class;
  - "computation" is derived from this interpretation of "computing". In the French language the term "calcul" will serve for either term;
  - "simulator" is a device which may use the same time scale as the real device or operate on an expanded or compressed time scale. In interpreting this term models of real devices to reduced or expanded scales are not regarded as simulators;
  - "record carrier" means 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 relative to the recorded information.
4. Attention is drawn to the Notes following the title of section G, especially as regards the definition of the term "variable".

**G06C DIGITAL COMPUTERS IN WHICH ALL THE COMPUTATION IS EFFECTED MECHANICALLY** (score computers for card games A63F 1/18; construction of keys, printing mechanisms, or other parts of general application to the typewriting or printing art B41; keys or printing mechanisms for special applications, see the relevant subclass, e.g. G05G, G06K; cash registers G07G 1/00) [4]

### Note(s)

This subclass does not cover details of mechanisms covered by main groups G06C 9/00, G06C 11/00 or G06C 15/00, which are applicable to mechanical counters driven only through the lowest denomination. Such details are covered by subclass G06M.

### Subclass index

MACHINES CHARACTERISED BY THEIR STRUCTURAL INTERCONNECTION.....	27/00
FUNCTIONAL ELEMENTARY MECHANISMS	
Input; transfer; output; storage; computing.....	7/00, 9/00, 11/00, 13/00, 15/00
AUXILIARY MECHANISMS OR ARRANGEMENTS	
Conversion; decimal-point; programming; driving; auxiliary arrangements.....	17/00, 19/00, 21/00, 23/00, 25/00
NON-FUNCTIONAL ELEMENTS: HOUSINGS, FRAMEWORKS.....	5/00
COMBINATIONS OF COMPUTING MACHINES WITH OTHER MACHINES.....	29/00
COMPUTING AIDS, OTHER THAN MACHINES.....	1/00, 3/00

<b>1/00</b>	<b>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</b>	<b>13/00</b>	<b>Storage mechanisms</b> (mechanical counters with input only to the lowest order G06M; information storage in general G11)
<b>3/00</b>	<b>Arrangements for table look-up, e.g. menstruation table</b>	13/02	• Operand stores, e.g. pin carriage (input mechanisms G06C 7/00)
<b>5/00</b>	<b>Non-functional elements</b>	13/04	• Print buffer stores
5/02	• Housings; Frameworks	<b>15/00</b>	<b>Computing mechanisms; Actuating devices therefor</b> (mechanisms for operating automatically upon more than two numbers otherwise than by repeated addition or subtraction G06C 21/00)
<b>7/00</b>	<b>Input mechanisms</b> (pin carriage G06C 13/02)	15/02	• operating on the binary scale
7/02	• Keyboards		<b><u>Note(s)</u></b>
7/04	• • Interlocking devices, e.g. between keys (interlocking devices covered by this subclass, in general G06C 25/00)		Group G06C 15/02 takes precedence over groups G06C 15/04-G06C 15/42.
7/06	• • with one set of keys for each denomination	15/04	• Adding or subtracting devices (G06C 15/08 takes precedence)
7/08	• • with one set of keys for all denominations, e.g. ten-key board	15/06	• • having balance totalising; Obtaining sub-total
7/09	• Transfer of data from record carrier to computing mechanisms (sensing record carriers G06K 7/00)	15/08	• Multiplying or dividing devices; Devices for computing the exponent or root
7/10	• Transfer mechanisms, e.g. transfer of a figure from a ten-key keyboard into the pin carriage	15/10	• • having more than one denominational set of keys operating directly on computing mechanism
7/12	• Resetting devices, e.g. for the keyboard	15/12	• • having pin carriage
<b>9/00</b>	<b>Transfer mechanisms, e.g. for transmitting figures from the input mechanism into the computing mechanism</b> (G06C 7/10, G06C 11/00, G06C 15/00 take precedence)	15/14	• • having pin wheel, e.g. Odhner type
9/02	• Back-transfer arrangements, e.g. to transfer a value accumulated in a register back into the selection mechanism	15/16	• • having stepped-toothed actuating drums, e.g. Thomas type
<b>11/00</b>	<b>Output mechanisms</b> (marking record carriers in general, visual presentation in general of results of the mathematical operations G06K)	15/18	• • having multiplication table for forming partial products
11/02	• with visual indication, e.g. counter drum	15/20	• • adapted for short-cut multiplication or division [2]
11/04	• with printing mechanisms, e.g. for character-at-a-time or line-at-a-time printing	15/22	• Arrangements for two or more computing devices; Arrangements for subdivision into two or more computing mechanisms, e.g. splitting
11/06	• • having type hammers	15/24	• Devices for counting the cycles of operation in division or multiplication (item-counting devices G06C 25/02)
11/08	• with punching mechanism	15/26	• Devices for transfer between orders, e.g. tens-transfer device
11/10	• Arrangements for feeding single sheets or continuous web or tape, e.g. ejection device (conveying record carriers G06K 13/00); Line-spacing devices	15/28	• • where transfer is effected in one step
11/12	• • for feeding tape	15/30	• • where transfer is effected in two steps
		15/32	• • • with provision for simultaneous transfer between all orders
		15/34	• • where transfer is effected by planet gear, i.e. crawl type

## G06C

- 15/36 • • • with aligning means
- 15/38 • • for pin-wheel computing mechanisms
- 15/40 • • for stepped-toothed-drum computing mechanism
- 15/42 • Devices for resetting to zero or other datum
- 15/44 • Devices for comparing numerical values, e.g. zero check
- 15/46 • Arrangements for rounding-off
- 15/48 • Arrangements for selection of one out of several counting registers (arrangements for controlling subsequent operating functions G06C 21/04; item counters G06C 25/02)

### 17/00 Mechanisms for converting from one notational system to another, i.e. radix conversion

### 19/00 Decimal-point mechanisms; Analogous mechanisms for non-decimal notations

- 19/02 • Devices for indicating the point
- 19/04 • Devices for printing the point

### 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 G06C 15/08)

- 21/02 • in which the operation of the mechanism is determined by the position of the carriage

- 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 (arrangements for selection of one out of several counting registers G06C 15/48)

### 23/00 Driving mechanisms for functional elements

#### Note(s)

Group G06C 23/08 takes precedence over groups G06C 23/02-G06C 23/06.

- 23/02 • of main shaft
- 23/04 • of pin carriage, e.g. for step-by-step movement
- 23/06 • of tabulation devices, e.g. of carriage skip
- 23/08 • Hydraulic or pneumatic actuation

### 25/00 Auxiliary functional arrangements, e.g. interlocks (interlocks in keyboards G06C 7/04) [2]

- 25/02 • Item-counting devices (devices for counting the cycles of operation in division or multiplication G06C 15/24)

### 27/00 Computing machines characterised by the structural interrelation of their functional units, e.g. invoicing machines

### 29/00 Combinations of computing machines with other machines, e.g. with typewriter, with money-changing apparatus

## G06D DIGITAL FLUID-PRESSURE COMPUTING DEVICES

#### Note(s)

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

### 1/00 Details, e.g. functional units (individual logic elements F15C; valves F16K)

- 1/02 • having at least one moving part, e.g. spool valve
- 1/04 • • Adding; Subtracting
- 1/06 • • Multiplying; Dividing
- 1/08 • having no moving parts
- 1/10 • • Adding; Subtracting
- 1/12 • • Multiplying; Dividing

### 3/00 Computing devices characterised by the interrelationship of the functional units and having at least one moving part

### 5/00 Computing devices characterised by the interrelationship of the functional units and having no moving parts

### 7/00 Computing devices characterised by the combination of hydraulic or pneumatic functional elements with at least one other type of functional element

## G06E OPTICAL COMPUTING DEVICES (digital storage using optical elements G11C 13/04) [5]

#### Note(s)

1. This subclass covers all devices in which at least one computing function is performed by optical means.
2. If other aspects, for example mechanical, fluid pressure or electrical computing, are of interest, classification is also made in the relevant subclass for such aspects.

### 1/00 Devices for processing exclusively digital data [5]

- 1/02 • operating upon the order or content of the data handled [5]
- 1/04 • • for performing computations using exclusively denominational number representation, e.g. using binary, ternary, decimal representation [5]

- 1/06 • • for performing computations using a digital non-denominational number representation, i.e. number representation without radix; using combinations of denominational and non-denominational number representations [5]

### 3/00 Devices not provided for in group G06E 1/00, e.g. for processing analogue or hybrid data [5]

**G06F ELECTRIC DIGITAL DATA PROCESSING** (computers in which a part of the computation is effected hydraulically or pneumatically G06D, optically G06E; computer systems based on specific computational models G06N)

### Note(s)

In this subclass, the following terms or expressions are used with the meaning indicated:

- "handling" includes processing or transporting of data;
- "data processing equipment" means an association of an electric digital data processor classifiable under group G06F 7/00, with one or more arrangements classifiable under groups G06F 1/00-G06F 5/00 and G06F 9/00-G06F 13/00.

### Subclass index

DATA PROCESSING.....	7/00, 15/00-19/00
INPUT, OUTPUT; INTERCONNECTIONS BETWEEN FUNCTIONAL ELEMENTS.....	3/00, 13/00
ADDRESSING OR ALLOCATION.....	12/00
CONVERSION; PROGRAMME CONTROL; ERROR DETECTION, MONITORING.....	5/00, 9/00, 11/00
DETAILS.....	1/00
SECURITY ARRANGEMENTS.....	21/00

**1/00 Details not covered by groups G06F 3/00-G06F 13/00 and G06F 21/00** (architectures of general purpose stored programme computers G06F 15/76) [1, 2006.01]

- 1/02 • Digital function generators
- 1/025 • • for functions having two-valued amplitude, e.g. Walsh functions [5]
- 1/03 • • working, at least partly, by table look-up (G06F 1/025 takes precedence) [5]

### Note(s)

In order to be classified in this group, the table must contain function values of the desired or an intermediate function, not merely coefficients.

- 1/035 • • • Reduction of table size [5]
- 1/04 • Generating or distributing clock signals or signals derived directly therefrom
- 1/06 • • Clock generators producing several clock signals [5]
- 1/08 • • Clock generators with changeable or programmable clock frequency [5]
- 1/10 • • Distribution of clock signals [5]
- 1/12 • • Synchronisation of different clock signals [5]
- 1/14 • • Time supervision arrangements, e.g. real time clock [5]
- 1/16 • Constructional details or arrangements [5]
- 1/18 • • Packaging or power distribution [5]
- 1/20 • • Cooling means [5]
- 1/22 • Means for limiting or controlling the pin/gate ratio [5]
- 1/24 • Resetting means (restoration from data faults G06F 11/00) [5]
- 1/26 • Power supply means, e.g. regulation thereof (for memories G11C) [5]
- 1/28 • • Supervision thereof, e.g. detecting power-supply failure by out of limits supervision [5]
- 1/30 • • Means for acting in the event of power-supply failure or interruption, e.g. power-supply fluctuations (for resetting only G06F 1/24; involving the processing of data-words G06F 11/00) [5]
- 1/32 • • Means for saving power [5]

**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 [4]**

- 3/01 • Input arrangements or combined input and output arrangements for interaction between user and computer (G06F 3/16 takes precedence) [2006.01]
- 3/02 • • Input arrangements using manually operated switches, e.g. using keyboards or dials [3, 2006.01]
- 3/023 • • • Arrangements for converting discrete items of information into a coded form, e.g. arrangements for interpreting keyboard generated codes as alphanumeric codes, operand codes or instruction codes [3, 2006.01]
- 3/027 • • • • for insertion of the decimal point [3, 2006.01]
- 3/03 • • Arrangements for converting the position or the displacement of a member into a coded form [3, 2006.01]

### Note(s) [2006.01]

In this group, at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place."

- 3/033 • • • Pointing devices displaced or positioned by the user; Accessories therefor (digitisers characterised by the transducing means G06F 3/041) [3, 2006.01, 2013.01]
- 3/0338 • • • • with detection of limited linear or angular displacement of an operating part of the device from a neutral position, e.g. isotonic or isometric joysticks [2013.01]
- 3/0346 • • • • with detection of the device orientation or free movement in a 3D space, e.g. 3D mice, 6-DOF [six degrees of freedom] pointers using gyroscopes, accelerometers or tilt-sensors [2013.01]
- 3/0354 • • • • with detection of 2D relative movements between the device, or an operating part thereof, and a plane or surface, e.g. 2D mice, trackballs, pens or pucks [2013.01]
- 3/0362 • • • • with detection of 1D translations or rotations of an operating part of the device, e.g. scroll wheels, sliders, knobs, rollers or belts [2013.01]

- 3/037 • • • using the raster scan of a cathode-ray tube (CRT) for detecting the position of the member, e.g. light pens cooperating with CRT monitors [3, 2006.01, 2013.01]
- 3/038 • • • Control and interface arrangements therefor, e.g. drivers or device-embedded control circuitry [2006.01, 2013.01]
- 3/039 • • • Accessories therefor, e.g. mouse pads [2006.01, 2013.01]
- 3/041 • • • Digitisers, e.g. for touch screens or touch pads, characterised by the transducing means [2006.01]
- 3/042 • • • by opto-electronic means [2006.01]
- 3/043 • • • using propagating acoustic waves [2006.01]
- 3/044 • • • by capacitive means [2006.01]
- 3/045 • • • using resistive elements, e.g. a single continuous surface or two parallel surfaces put in contact [2006.01]
- 3/046 • • • by electromagnetic means [2006.01]
- 3/047 • • • using sets of wires, e.g. crossed wires [2006.01]
- 3/048 • • Interaction techniques based on graphical user interfaces [GUIs] [2006.01, 2013.01]

#### **Note(s) [2013.01]**

1. This group covers subject matter where the focus is placed on the way the user can interact with the displayed data. The mere presence of a standard GUI in the context of the disclosure of a specific software application or a specific device capable of processing data related to its specific function, should in general be classified in the appropriate subclasses related to those software applications or specific devices.
  2. In this group, multi-aspect classification is applied, so that subject matter characterised by aspects covered by more than one of its subgroups, which is considered to represent information of interest for search, should be classified in each of those subgroups.
- 3/0481 • • • based on specific properties of the displayed interaction object or a metaphor-based environment, e.g. interaction with desktop elements like windows or icons, or assisted by a cursor's changing behaviour or appearance [2013.01]
  - 3/0482 • • • interaction with lists of selectable items, e.g. menus [2013.01]
  - 3/0483 • • • interaction with page-structured environments, e.g. book metaphor [2013.01]
  - 3/0484 • • • for the control of specific functions or operations, e.g. selecting or manipulating an object or an image, setting a parameter value or selecting a range [2013.01]
  - 3/0485 • • • Scrolling or panning [2013.01]
  - 3/0486 • • • Drag-and-drop [2013.01]
  - 3/0487 • • • using specific features provided by the input device, e.g. functions controlled by the rotation of a mouse with dual sensing arrangements, or of the nature of the input device, e.g. tap gestures based on pressure sensed by a digitiser [2013.01]
  - 3/0488 • • • using a touch-screen or digitiser, e.g. input of commands through traced gestures [2013.01]
  - 3/0489 • • • using dedicated keyboard keys or combinations thereof [2013.01]

- 3/05 • Digital input using the sampling of an analogue quantity at regular intervals of time (sample-and-hold arrangements G11C 27/02)
  - 3/06 • Digital input from, or digital output to, record carriers
  - 3/08 • • from or to individual record carriers, e.g. punched card
  - 3/09 • Digital output to typewriters [3]
  - 3/12 • Digital output to print unit (arrangements for producing a permanent visual presentation of the output data using printers G06K 15/02)
  - 3/13 • Digital output to plotter (arrangements for producing a permanent visual presentation of the output data using plotters G06K 15/22) [3]
  - 3/14 • Digital output to display device
  - 3/147 • • using display panels [3]
  - 3/153 • • using cathode-ray tubes [3]
  - 3/16 • Sound input; Sound output (conversion of speech into digital information or vice versa G10L)
  - 3/18 • Digital input from automatic curve follower [3]
- 5/00 Methods or arrangements for data conversion without changing the order or content of the data handled [4]**
- 5/01 • for shifting, e.g. justifying, scaling, normalising [5]
  - 5/06 • for changing the speed of data flow, i.e. speed regularising
  - 5/08 • • having a sequence of storage locations, the intermediate ones not being accessible for either enqueue or dequeue operations, e.g. using a shift register [2006.01]
  - 5/10 • • having a sequence of storage locations each being individually accessible for both enqueue and dequeue operations, e.g. using random access memory [2006.01]
  - 5/12 • • • Means for monitoring the fill level; Means for resolving contention, i.e. conflicts between simultaneous enqueue and dequeue operations [2006.01]
  - 5/14 • • • for overflow or underflow handling, e.g. full or empty flags [2006.01]
  - 5/16 • • Multiplexed systems, i.e. using two or more similar devices which are alternately accessed for enqueue and dequeue operations, e.g. ping-pong buffers [2006.01]
- 7/00 Methods or arrangements for processing data by operating upon the order or content of the data handled (logic circuits H03K 19/00)**
- 7/02 • Comparing digital values (G06F 7/06, G06F 7/38 take precedence)
  - 7/04 • • Identity comparison, i.e. for like or unlike values
  - 7/06 • Arrangements for sorting, selecting, merging, or comparing data on individual record carriers
  - 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 G06F 7/16)
  - 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
  - 7/12 • • • with provision for printing-out a list of selected items
  - 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

- 7/16 • • • Combined merging and sorting
- 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
- 7/22 • Arrangements for sorting or merging computer data on continuous record carriers, e.g. tape, drum, disc
- 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 (G06F 7/36 takes precedence)
- 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
- 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 (G06F 7/36 takes precedence)
- 7/36 • • Combined merging and sorting
- 7/38 • Methods or arrangements for performing computations using exclusively denominational number representation, e.g. using binary, ternary, decimal representation [3]
- 7/40 • • using contact-making devices, e.g. electromagnetic relay (G06F 7/46 takes precedence)
- 7/42 • • • Adding; Subtracting
- 7/44 • • • Multiplying; Dividing
- 7/46 • • using electromechanical counter-type accumulators
- 7/48 • • using non-contact-making devices, e.g. tube, solid state device; using unspecified devices [3]
- 7/483 • • • Computations with numbers represented by a non-linear combination of denominational numbers, e.g. rational numbers, logarithmic number system or floating-point numbers [2006.01]
- 7/485 • • • • Adding; Subtracting [2006.01]
- 7/487 • • • • Multiplying; Dividing [2006.01]
- 7/49 • • • Computations with a radix, other than binary, 8, 16 or decimal, e.g. ternary, negative or imaginary radices, mixed radix [3]
- 7/491 • • • Computations with decimal numbers [2006.01]
- 7/492 • • • • using a binary weighted representation within each denomination [2006.01]
- 7/493 • • • • • the representation being the natural binary coded representation, i.e. 8421-code [2006.01]
- 7/494 • • • • • Adding; Subtracting [2006.01]
- 7/495 • • • • • • in digit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other [2006.01]
- 7/496 • • • • • Multiplying; Dividing [2006.01]
- 7/498 • • • • using counter-type accumulators [2006.01]
- 7/499 • • • Denomination or exception handling, e.g. rounding, overflow [2006.01]
- 7/50 • • • Adding; Subtracting (G06F 7/483-G06F 7/491, G06F 7/544-G06F 7/556 take precedence) [3, 2006.01]
- 7/501 • • • • Half or full adders, i.e. basic adder cells for one denomination [2006.01]
- 7/502 • • • • • Half adders; Full adders consisting of two cascaded half adders [2006.01]
- 7/503 • • • • • using carry switching, i.e. the incoming carry being connected directly, or only via an inverter, to the carry output under control of a carry propagate signal [2006.01]
- 7/504 • • • • in bit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other [2006.01]
- 7/505 • • • • in bit-parallel fashion, i.e. having a different digit-handling circuit for each denomination [2006.01]
- 7/506 • • • • • with simultaneous carry generation for, or propagation over, two or more stages [2006.01]
- 7/507 • • • • • using selection between two conditionally calculated carry or sum values [2006.01]
- 7/508 • • • • • using carry look-ahead circuits [2006.01]
- 7/509 • • • • • for multiple operands, e.g. digital integrators [2006.01]
- 7/52 • • • Multiplying; Dividing (G06F 7/483-G06F 7/491, G06F 7/544-G06F 7/556 take precedence) [3, 2006.01]
- 7/523 • • • • Multiplying only [2006.01]
- 7/525 • • • • • in serial-serial fashion, i.e. both operands being entered serially (G06F 7/533 takes precedence) [2006.01]
- 7/527 • • • • • in serial-parallel fashion, i.e. one operand being entered serially and the other in parallel (G06F 7/533 takes precedence) [2006.01]
- 7/53 • • • • • in parallel-parallel fashion, i.e. both operands being entered in parallel (G06F 7/533 takes precedence) [2006.01]
- 7/533 • • • • • Reduction of the number of iteration steps or stages, e.g. using the Booth algorithm, log-sum, odd-even [2006.01]
- 7/535 • • • • Dividing only [2006.01]
- 7/537 • • • • • Reduction of the number of iteration steps or stages, e.g. using the Sweeney-Robertson-Tocher (SRT) algorithm [2006.01]
- 7/544 • • • for evaluating functions by calculation (with a look-up table G06F 1/02) [3]
- 7/548 • • • • Trigonometric functions; Co-ordinate transformations [3]
- 7/552 • • • • Powers or roots [3]
- 7/556 • • • • Logarithmic or exponential functions [3]
- 7/57 • • • Arithmetic logic units [ALU], i.e. arrangements or devices for performing two or more of the operations covered by groups G06F 7/483-G06F 7/556 or for performing logical operations [2006.01]
- 7/575 • • • • Basic arithmetic logic units, i.e. devices selectable to perform either addition, subtraction or one of several logical operations, using, at least partially, the same circuitry [2006.01]
- 7/58 • Random or pseudo-random number generators [3]
- 7/60 • Methods or arrangements for performing computations using a digital non-denominational number representation, i.e. number representation without radix; Computing devices using combinations of denominational and non-denominational quantity representations [3]

- 7/62 • • Performing operations exclusively by counting total number of pulses [3]
- 7/64 • • Digital differential analysers, i.e. computing devices for differentiation, integration or solving differential or integral equations, using pulses representing increments; Other incremental computing devices for solving difference equations (G06F 7/70 takes precedence; differential analysers using hybrid computing techniques G06J 1/02) [3]
- 7/66 • • • wherein pulses represent unitary increments only [3]
- 7/68 • • using pulse rate multipliers or dividers (G06F 7/70 takes precedence) [3]
- 7/70 • • using stochastic pulse trains, i.e. randomly occurring pulses the average pulse rates of which represent numbers [3]
- 7/72 • • using residue arithmetic [3]
- 7/74 • Selecting or encoding within a word the position of one or more bits having a specified value, e.g. most or least significant one or zero detection, priority encoders [2006.01]
- 7/76 • Arrangements for rearranging, permuting or selecting data according to predetermined rules, independently of the content of the data [2006.01]
- 7/78 • • for changing the order of data flow, e.g. matrix transposition, LIFO buffers; Overflow or underflow handling therefor [2006.01]
- 9/00 Arrangements for programme control, e.g. control unit** (programme control for peripheral devices G06F 13/10) [4]
- 9/02 • using wired connections, e.g. plugboard
- 9/04 • using record carriers containing only programme instructions (G06F 9/06 takes precedence)
- 9/06 • using stored programme, i.e. using internal store of processing equipment to receive and retain programme
- 9/22 • • Micro-control or micro-programme arrangements [3]
- 9/24 • • • Loading of the micro-programme [3]
- 9/26 • • • Address formation of the next micro-instruction (G06F 9/28 takes precedence) [3]
- 9/28 • • • Enhancement of operational speed, e.g. by using several micro-control devices operating in parallel [3]
- 9/30 • • Arrangements for executing machine- instructions, e.g. instruction decode (for executing micro-instructions G06F 9/22; for executing subprogrammes G06F 9/40) [3]
- 9/302 • • • Controlling the executing of arithmetic operations [5]
- 9/305 • • • Controlling the executing of logical operations [5]
- 9/308 • • • Controlling single bit operations (G06F 9/305 takes precedence) [5]
- 9/312 • • • Controlling loading, storing or clearing operations [5]
- 9/315 • • • Controlling moving, shifting or rotation operations [5]
- 9/318 • • • with operation extension or modification [5]
- 9/32 • • • Address formation of the next instruction, e.g. incrementing the instruction counter, jump (G06F 9/38 takes precedence; subprogramme jump G06F 9/42) [3]
- 9/34 • • • Addressing or accessing the instruction operand or the result [3, 5]
- 9/345 • • • • of multiple operands or results [5]
- 9/35 • • • • Indirect addressing [5]
- 9/355 • • • • Indexed addressing [5]
- 9/38 • • • Concurrent instruction execution, e.g. pipeline, look ahead [3]
- 9/40 • • Arrangements for executing subprogrammes, i.e. combinations of several instructions [3]
- 9/42 • • • Formation of subprogramme-jump address or of return address [3]
- 9/44 • • Arrangements for executing specific programmes [3]
- 9/445 • • • Programme loading or initiating [5]
- 9/45 • • • Compilation or interpretation of high level programme languages [5]
- 9/455 • • • Emulation; Software simulation [5]
- 9/46 • • Multiprogramming arrangements [3]
- 9/48 • • • Programme initiating; Programme switching, e.g. by interrupt [7]
- 9/50 • • • Allocation of resources, e.g. of the central processing unit (CPU) [7]
- 9/52 • • • Programme synchronisation; Mutual exclusion, e.g. by means of semaphores [7]
- 9/54 • • • Interprogramme communication [7]
- 11/00 Error detection; Error correction; Monitoring** (methods or arrangements for verifying the correctness of marking on a record carrier G06K 5/00; in information storage based on relative movement between record carrier and transducer G11B, e.g. G11B 20/18; in static stores G11C 29/00) [4]
- 11/07 • Responding to the occurrence of a fault, e.g. fault tolerance [7]
- 11/08 • • Error detection or correction by redundancy in data representation, e.g. by using checking codes
- 11/10 • • • Adding special bits or symbols to the coded information, e.g. parity check, casting out nines or elevens
- 11/14 • • Error detection or correction of the data by redundancy in operation, e.g. by using different operation sequences leading to the same result (G06F 11/16 takes precedence) [3]
- 11/16 • • Error detection or correction of the data by redundancy in hardware [3]
- 11/18 • • • using passive fault-masking of the redundant circuits, e.g. by quadding or by majority decision circuits [3]
- 11/20 • • • using active fault-masking, e.g. by switching out faulty elements or by switching in spare elements [3]
- 11/22 • Detection or location of defective computer hardware by testing during standby operation or during idle time, e.g. start-up testing (testing of digital circuits, e.g. of separate computer components, G01R 31/317) [3]
- 11/24 • • Marginal testing [3]
- 11/25 • • Testing of logic operation, e.g. by logic analysers [6]
- 11/26 • • Functional testing [3]
- 11/263 • • • Generation of test inputs, e.g. test vectors, patterns or sequences [6]
- 11/267 • • • Reconfiguring circuits for testing, e.g. LSSD, partitioning [6]
- 11/27 • • • Built-in tests [6]
- 11/273 • • • Tester hardware, i.e. output processing circuits [6]
- 11/277 • • • • with comparison between actual response and known fault-free response [6]

- 11/28 • by checking the correct order of processing (G06F 11/07, G06F 11/22 take precedence) [3]
- 11/30 • Monitoring [3]
- 11/32 • • with visual indication of the functioning of the machine [3]
- 11/34 • • Recording or statistical evaluation of computer activity, e.g. of down time, of input/output operation [3]
- 11/36 • Preventing errors by testing or debugging of software [7]
- 12/00 Accessing, addressing or allocating within memory systems or architectures** (information storage in general G11) [4, 5]
- 12/02 • Addressing or allocation; Relocation (programme address sequencing G06F 9/00; arrangements for selecting an address in a digital store G11C 8/00) [4]
- 12/04 • • Addressing variable-length words or parts of words [4]
- 12/06 • • Addressing a physical block of locations, e.g. base addressing, module addressing, address space extension, memory dedication (G06F 12/08 takes precedence) [4]
- 12/08 • • in hierarchically structured memory systems, e.g. virtual memory systems [4]
- 12/10 • • • Address translation [4]
- 12/12 • • • Replacement control [4]
- 12/14 • Protection against unauthorised use of memory [4]
- 12/16 • Protection against loss of memory contents [4]
- 13/00 Interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units** (interface circuits for specific input/output devices G06F 3/00; multi-processor systems G06F 15/16) [4]
- 13/10 • Programme control for peripheral devices (G06F 13/14-G06F 13/42 take precedence) [4]
- 13/12 • • using hardware independent of the central processor, e.g. channel or peripheral processor [4]
- 13/14 • Handling requests for interconnection or transfer [4]
- 13/16 • • for access to memory bus (G06F 13/28 takes precedence) [4]
- 13/18 • • • with priority control [4]
- 13/20 • • for access to input/output bus [4]
- 13/22 • • • using successive scanning, e.g. polling (G06F 13/24 takes precedence) [4]
- 13/24 • • • using interrupt (G06F 13/32 takes precedence) [4]
- 13/26 • • • • with priority control [4]
- 13/28 • • • using burst mode transfer, e.g. direct memory access, cycle steal (G06F 13/32 takes precedence) [4]
- 13/30 • • • • with priority control [4]
- 13/32 • • • using combination of interrupt and burst mode transfer [4]
- 13/34 • • • • with priority control [4]
- 13/36 • • for access to common bus or bus system [4]
- 13/362 • • • with centralised access control [5]
- 13/364 • • • • using independent requests or grants, e.g. using separated request and grant lines [5]
- 13/366 • • • • using a centralised polling arbiter [5]
- 13/368 • • • with decentralised access control [5]
- 13/37 • • • • using a physical-position-dependent priority, e.g. daisy chain, round robin or token passing [5]
- 13/372 • • • • using a time-dependent priority, e.g. individually loaded time counters or time slot [5]
- 13/374 • • • • using a self-select method with individual priority code comparator [5]
- 13/376 • • • • using a contention resolving method, e.g. collision detection, collision avoidance [5]
- 13/378 • • • • using a parallel poll method [5]
- 13/38 • Information transfer, e.g. on bus (G06F 13/14 takes precedence) [4]
- 13/40 • • Bus structure [4]
- 13/42 • • Bus transfer protocol, e.g. handshake; Synchronisation [4]
- 15/00 Digital computers in general** (details G06F 1/00-G06F 13/00); **Data processing equipment in general**
- 15/02 • manually operated with input through keyboard and computation using a built-in programme, e.g. pocket calculators
- 15/04 • programmed simultaneously with the introduction of data to be processed, e.g. on the same record carrier
- 15/08 • using a plugboard for programming [5]
- 15/10 • • Tabulators [5]
- 15/12 • • • having provision for both printed and punched output [5]
- 15/14 • • Calculating-punches [5]
- 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
- 15/163 • • Interprocessor communication [6]
- 15/167 • • • using a common memory, e.g. mailbox [6]
- 15/17 • • • using an input/output type connection, e.g. channel, I/O port [6]
- 15/173 • • • using an interconnection network, e.g. matrix, shuffle, pyramid, star or snowflake [6]
- 15/177 • • Initialisation or configuration control (configuration control for monitoring, testing or in case of failure G06F 11/00) [6]
- 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 G05B 13/00)
- 15/76 • Architectures of general purpose stored programme computers (with programme plugboard G06F 15/08; multicomputers G06F 15/16; general purpose image data processing G06T 1/00) [5, 6]
- 15/78 • • comprising a single central processing unit [5]
- 15/80 • • comprising an array of processing units with common control, e.g. single instruction multiple data processors (G06F 15/82 takes precedence) [5]
- 15/82 • • data or demand driven [5]
- 17/00 Digital computing or data processing equipment or methods, specially adapted for specific functions** [6]
- 17/10 • Complex mathematical operations [6]
- 17/11 • • for solving equations [6]
- 17/12 • • • Simultaneous equations [6]
- 17/13 • • • Differential equations (using digital differential analysers G06F 7/64) [6]
- 17/14 • • Fourier, Walsh or analogous domain transformations [6]
- 17/15 • • Correlation function computation [6]
- 17/16 • • Matrix or vector computation [6]
- 17/17 • • Function evaluation by approximation methods, e.g. interpolation or extrapolation, smoothing or least mean square method [6]

- 17/18 • • for evaluating statistical data [6]
- 17/20 • Handling natural language data (speech analysis or synthesis G10L) [6]
- 17/21 • • Text processing (G06F 17/27, G06F 17/28 take precedence) [6]
- 17/22 • • • Manipulating or registering by use of codes, e.g. in sequence of text characters [6]
- 17/24 • • • Editing, e.g. insert/delete [6]
- 17/25 • • • Automatic justification [6]
- 17/26 • • • Automatic hyphenation [6]
- 17/27 • • Automatic analysis, e.g. parsing, orthograph correction [6]
- 17/28 • • Processing or translating of natural language (G06F 17/27 takes precedence) [6]
- 17/30 • Information retrieval; Database structures therefor [6]
- 17/40 • Data acquisition and logging (for input to computer G06F 3/00) [6]
- 17/50 • Computer-aided design (for the design of test circuits for static stores G11C 29/54) [6, 2006.01]

**19/00 Digital computing or data processing equipment or methods, specially adapted for specific applications** (G06F 17/00 takes precedence; data processing systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes G06Q) [6, 2006.01, 2011.01]

**Note(s)**

This group covers:

- special constructions of computers to permit or facilitate use in specific applications;
- non-structural adaptations of computers to a specific application, e.g. computing methods.

- 19/10 • Bioinformatics, i.e. methods or systems for genetic or protein-related data processing in computational molecular biology (in silico methods of screening virtual chemical libraries C40B 30/02; in silico or mathematical methods of creating virtual chemical libraries C40B 50/02) [2011.01]

**Note(s) [2011.01]**

1. This group also covers bioinformatics methods or systems where digital data processing is inherent or implicit, but not explicitly mentioned.
  2. In this group, the following term is used with the meaning indicated:
    - "systems" includes apparatus.
  3. In this group, at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.
- 19/12 • • for modelling or simulation in systems biology, e.g. probabilistic or dynamic models, gene-regulatory networks, protein interaction networks or metabolic networks [2011.01]
  - 19/14 • • for phylogeny or evolution, e.g. evolutionarily conserved regions determination or phylogenetic tree construction [2011.01]
  - 19/16 • • for molecular structure, e.g. structure alignment, structural or functional relations, protein folding, domain topologies, drug targeting using structure data, involving two-dimensional or three-dimensional structures [2011.01]

- 19/18 • • for functional genomics or proteomics, e.g. genotype-phenotype associations, linkage disequilibrium, population genetics, binding site identification, mutagenesis, genotyping or genome annotation, protein-protein interactions or protein-nucleic acid interactions [2011.01]
- 19/20 • • for hybridisation or gene expression, e.g. microarrays, sequencing by hybridisation, normalisation, profiling, noise correction models, expression ratio estimation, probe design or probe optimisation [2011.01]
- 19/22 • • for sequence comparison involving nucleotides or amino acids, e.g. homology search, motif or SNP [Single-Nucleotide Polymorphism] discovery or sequence alignment [2011.01]
- 19/24 • • for machine learning, data mining or biostatistics, e.g. pattern finding, knowledge discovery, rule extraction, correlation, clustering or classification [2011.01]
- 19/26 • • for data visualisation, e.g. graphics generation, display of maps or networks or other visual representations [2011.01]
- 19/28 • • for programming tools or database systems, e.g. ontologies, heterogeneous data integration, data warehousing or computing architectures [2011.01]

**21/00 Security arrangements for protecting computers, components thereof, programs or data against unauthorised activity** [2006.01, 2013.01]

- 21/10 • Protecting distributed programs or content, e.g. vending or licensing of copyrighted material (protection in video systems or pay television H04N 7/16) [2013.01]

**Note(s) [2013.01]**

In this group, the following terms or expressions are used with the meaning indicated:

- "content" means any intellectually created work whose copyright is to be safeguarded.

- 21/12 • • Protecting executable software [2013.01]
- 21/14 • • • against software analysis or reverse engineering, e.g. by obfuscation [2013.01]
- 21/16 • • Program or content traceability, e.g. by watermarking (digital watermarking on images H04N 1/32) [2013.01]
- 21/30 • Authentication, i.e. establishing the identity or authorisation of security principals [2013.01]
- 21/31 • • User authentication [2013.01]
- 21/32 • • • using biometric data, e.g. fingerprints, iris scans or voiceprints [2013.01]
- 21/33 • • • using certificates [2013.01]
- 21/34 • • • involving the use of external additional devices, e.g. dongles or smart cards [2013.01]
- 21/35 • • • communicating wirelessly [2013.01]
- 21/36 • • • by graphic or iconic representation [2013.01]
- 21/40 • • • by quorum, i.e. whereby two or more security principals are required [2013.01]
- 21/41 • • • where a single sign-on provides access to a plurality of computers [2013.01]
- 21/42 • • • using separate channels for security data [2013.01]
- 21/43 • • • • wireless channels [2013.01]
- 21/44 • • Program or device authentication [2013.01]
- 21/45 • • Structures or tools for the administration of authentication [2013.01]
- 21/46 • • • by designing passwords or checking the strength of passwords [2013.01]

- 21/50 • Monitoring users, programs or devices to maintain the integrity of platforms, e.g. of processors, firmware or operating systems [2013.01]
- 21/51 • • at application loading time, e.g. accepting, rejecting, starting or inhibiting executable software based on integrity or source reliability [2013.01]
- 21/52 • • during program execution, e.g. stack integrity, buffer overflow or preventing unwanted data erasure [2013.01]
- 21/53 • • • by executing in a restricted environment, e.g. sandbox or secure virtual machine [2013.01]
- 21/54 • • • by adding security routines or objects to programs [2013.01]
- 21/55 • • Detecting local intrusion or implementing counter-measures [2013.01]
- 21/56 • • • Computer malware detection or handling, e.g. anti-virus arrangements [2013.01]
- 21/57 • • Certifying or maintaining trusted computer platforms, e.g. secure boots or power-downs, version controls, system software checks, secure updates or assessing vulnerabilities [2013.01]
- 21/60 • Protecting data [2013.01]
- 21/62 • • Protecting access to data via a platform, e.g. using keys or access control rules [2013.01]
- 21/64 • • Protecting data integrity, e.g. using checksums, certificates or signatures [2013.01]
- 21/70 • Protecting specific internal or peripheral components, in which the protection of a component leads to protection of the entire computer [2013.01]
- 21/71 • • to assure secure computing or processing of information [2013.01]
- 21/72 • • • in cryptographic circuits [2013.01]
- 21/73 • • • by creating or determining hardware identification, e.g. serial numbers [2013.01]
- 21/74 • • • operating in dual or compartmented mode, i.e. at least one secure mode [2013.01]
- 21/75 • • • by inhibiting the analysis of circuitry or operation, e.g. to counteract reverse engineering [2013.01]
- 21/76 • • • in application-specific integrated circuits [ASICs] or field-programmable devices, e.g. field-programmable gate arrays [FPGAs] or programmable logic devices [PLDs] [2013.01]
- 21/77 • • • in smart cards [2013.01]
- 21/78 • • to assure secure storage of data (address-based protection against unauthorised use of memory G06F 12/14; record carriers for use with machines and with at least a part designed to carry digital markings G06K 19/00) [2013.01]
- 21/79 • • • in semiconductor storage media, e.g. directly-addressable memories [2013.01]
- 21/80 • • • in storage media based on magnetic or optical technology, e.g. disks with sectors (preventing unauthorised reproduction or copying of disk-type recordable media G11B 20/00) [2013.01]
- 21/81 • • by operating on the power supply, e.g. enabling or disabling power-on, sleep or resume operations [2013.01]
- 21/82 • • Protecting input, output or interconnection devices [2013.01]
- 21/83 • • • input devices, e.g. keyboards, mice or controllers thereof [2013.01]
- 21/84 • • • output devices, e.g. displays or monitors [2013.01]
- 21/85 • • • interconnection devices, e.g. bus-connected or in-line devices [2013.01]
- 21/86 • • Secure or tamper-resistant housings [2013.01]
- 21/87 • • • by means of encapsulation, e.g. for integrated circuits [2013.01]
- 21/88 • • Detecting or preventing theft or loss [2013.01]

**G06G ANALOGUE COMPUTERS** (analogue optical computing devices G06E 3/00; computer systems based on specific computational models G06N)

- 1/00 Hand-manipulated computing devices** (planimeters G01B 5/26)
- 1/02 • Devices in which computing is effected by adding, subtracting, or comparing lengths of parallel or concentric graduated scales
- 1/04 • • characterised by construction (G06G 1/10 takes precedence)
- 1/06 • • • with rectilinear scales, e.g. slide rule
- 1/08 • • • with circular or helical scales
- 1/10 • • characterised by the graduation
- 1/12 • • • logarithmic graduations, e.g. for multiplication
- 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
- 1/16 • in which a straight or curved line has to be drawn through related points on one or more families of curves
- 3/00 Devices in which the computing operation is performed mechanically** (G06G 1/00 takes precedence)
- 3/02 • for performing additions or subtractions, e.g. differential gearing
- 3/04 • for performing multiplications or divisions, e.g. variable-ratio gearing
- 3/06 • for evaluating functions by using cams and cam followers
- 3/08 • for integrating or differentiating, e.g. by wheel and disc
- 3/10 • for simulating specific processes, systems, or devices
- 5/00 Devices in which the computing operation is performed by means of fluid-pressure elements** (such elements in general F15C)
- 7/00 Devices in which the computing operation is performed by varying electric or magnetic quantities** (neural networks for image data processing G06T; speech analysis or synthesis G10L)
- 7/02 • Details not covered by groups G06G 7/04-G06G 7/10
- 7/04 • Input or output devices (graph readers G06K 11/00; using function plotters, co-ordinate plotters G06K 15/22)
- 7/06 • Programming arrangements, e.g. plugboard for interconnecting functional units of the computer; Digital programming
- 7/10 • Power supply arrangements
- 7/12 • Arrangements for performing computing operations, e.g. amplifiers specially adapted therefor (amplifiers in general H03F)

## G06G

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| <p>7/122 • • for optimisation, e.g. least square fitting, linear programming, critical path analysis, gradient method [2]</p> <p>7/14 • • for addition or subtraction (of vector quantities G06G 7/22)</p> <p>7/16 • • for multiplication or division</p> <p>7/161 • • • with pulse modulation, e.g. modulation of amplitude, width, frequency, phase, or form [2]</p> <p>7/162 • • • using galvano-magnetic effects, e.g. Hall effect; using similar magnetic effects [2]</p> <p>7/163 • • • using a variable impedance controlled by one of the input signals, variable amplification or transfer function [2]</p> <p>7/164 • • • using means for evaluating powers, e.g. quarter square multiplier (evaluating powers G06G 7/20) [3]</p> <p>7/18 • • for integration or differentiation (G06G 7/19 takes precedence) [3]</p> <p>7/182 • • • using magnetic elements [3]</p> <p>7/184 • • • using capacitive elements [3]</p> <p>7/186 • • • • using an operational amplifier comprising a capacitor or a resistor in the feedback loop [3]</p> <p>7/188 • • • using electromechanical elements [3]</p> <p>7/19 • • for forming integrals of products, e.g. Fourier integrals, Laplace integrals, correlation integrals; for analysis or synthesis of functions using orthogonal functions (Fourier or spectrum analysis G01R 23/16) [3]</p> <p>7/195 • • • using electro-acoustic elements [3]</p> <p>7/20 • • for evaluating powers, roots, polynomials, mean square values, standard deviation (G06G 7/122, G06G 7/28 take precedence; gamma correction in television systems H04N 5/202, H04N 9/69) [3]</p> <p>7/22 • • for evaluating trigonometric functions; for conversion of co-ordinates; for computations involving vector quantities (trigonometric computations using simultaneous equations G06G 7/34)</p> <p>7/24 • • for evaluating logarithmic or exponential functions, e.g. hyperbolic functions</p> <p>7/25 • • for discontinuous functions, e.g. backlash, dead zone, limiting, absolute value, or peak value [2]</p> <p>7/26 • • Arbitrary function generators (using orthogonal functions, e.g. Fourier series, G06G 7/19; using curve follower G06K 11/02)</p> <p>7/28 • • • for synthesising functions by piecewise approximation</p> <p>7/30 • • for interpolation or extrapolation (G06G 7/122 takes precedence) [2]</p> <p>7/32 • • for solving of equations</p> | <p>7/34 • • • of simultaneous equations (G06G 7/122 takes precedence) [2]</p> <p>7/36 • • • of single equations of quadratic or higher degree (G06G 7/22, G06G 7/24 take precedence)</p> <p>7/38 • • • of differential or integral equations</p> <p>7/40 • • • • of partial differential equations (simulating specific devices G06G 7/48)</p> <p>7/42 • • • • • using electrolytic tank</p> <p>7/44 • • • • • using continuous medium, current-sensitive paper</p> <p>7/46 • • • • • using discontinuous medium, e.g. resistance network</p> <p>7/48 • Analogue computers for specific processes, systems, or devices, e.g. simulators [2]</p> <p>7/50 • • for distribution networks, e.g. for fluids (G06G 7/62 takes precedence)</p> <p>7/52 • • for economic systems; for statistics (G06G 7/122, G06G 7/19, G06G 7/20 take precedence) [3]</p> <p>7/54 • • for nuclear physics, e.g. nuclear reactors, radioactive fallout</p> <p>7/56 • • for heat flow (G06G 7/58 takes precedence)</p> <p>7/57 • • for fluid flow (G06G 7/50 takes precedence)</p> <p>7/58 • • for chemical processes (G06G 7/75 takes precedence)</p> <p>7/60 • • for living beings, e.g. their nervous systems</p> <p>7/62 • • for electric systems or apparatus</p> <p>7/625 • • • for impedance networks, e.g. determining response, determining poles or zeros, determining the Nyquist diagram (measuring impedance G01R 27/00) [2]</p> <p>7/63 • • • for power apparatus, e.g. motors, or supply distribution networks [2]</p> <p>7/635 • • • • for determining the most economical distribution in power systems [2]</p> <p>7/64 • • for non-electric machines, e.g. turbine</p> <p>7/66 • • for control systems</p> <p>7/68 • • for civil-engineering structures, e.g. beam, strut, girder</p> <p>7/70 • • for vehicles, e.g. to determine permissible loading of ships</p> <p>7/72 • • • Flight simulators (Link trainers G09B 9/08)</p> <p>7/75 • • for component analysis, e.g. of mixtures, of colours (G06G 7/122 takes precedence) [2]</p> <p>7/76 • • for traffic</p> <p>7/78 • • for direction-finding, locating, distance or velocity measuring, or navigation systems</p> <p>7/80 • • for gun-laying; for bomb aiming; for guiding missiles [2]</p> <p><b>99/00 Subject matter not provided for in other groups of this subclass [2009.01]</b></p> |
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**G06J HYBRID COMPUTING ARRANGEMENTS** (optical hybrid computing devices G06E 3/00; computer systems based on specific computational models G06N; neural networks for image data processing G06T; analogue/digital conversion, in general H03M 1/00)

### Note(s)

In this subclass, the following expression is used with the meaning indicated:

- "hybrid computing arrangement" is an arrangement in which part of the computation is digital and part is analogue.

**1/00 Hybrid computing arrangements** (digitally-programmed analogue computers G06G 7/06)

1/02 • Differential analysers

**3/00 Systems for conjoint operation of complete digital and complete analogue computers**

**G06K RECOGNITION OF DATA; PRESENTATION OF DATA; RECORD CARRIERS; HANDLING RECORD CARRIERS**  
(printing *per se* B41J)

**Note(s)**

1. This subclass covers:
  - marking, sensing, and conveying of record carriers;
  - recognising characters or other data;
  - presenting visually or otherwise the data recognised or the result of a computation.
2. This subclass does not cover printing *per se*.

**Subclass index**

READING	
Characters; graphs.....	9/00, 11/00
RECOGNISING	
Characters; patterns.....	9/00
CONVERTING POSITION OF MANUAL WRITING OR TRACING MEMBER INTO SIGNALS.....	11/00
PERMANENT VISUAL PRESENTATION OF OUTPUT DATA.....	15/00
MARKING, PRINTING-OUT.....	1/00, 3/00
VERIFYING.....	5/00
SENSING.....	7/00
CONVEYING.....	13/00
COMBINATIONS OF OPERATIONS COVERED BY TWO OR MORE OF THE PRECEDING GROUPS.....	17/00
RECORD CARRIERS, PUNCHED CARDS.....	19/00, 21/00

**1/00 Methods or arrangements for marking the record carrier in digital fashion**

- 1/02 • by punching
- 1/04 • • controlled by sensing markings on the record carrier being punched
- 1/05 • • High-speed punches, e.g. controlled by electric computer
- 1/06 • • Manually-controlled devices
- 1/08 • • • Card punches
- 1/10 • • • Tape punches
- 1/12 • otherwise than by punching
- 1/14 • by transferring data from a similar or dissimilar record carrier
- 1/16 • • by reproducing data from one punched card on to one or more punched cards without the code representation, i.e. duplicating
- 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
- 1/20 • Simultaneous marking of record carrier and printing-out of data, e.g. printing-punch
- 1/22 • • Simultaneous marking and printing on different record carriers, e.g. on different types of record carrier

**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**

- 3/02 • Translating markings on a record carrier into printed data on the same record carrier, i.e. interpreting

**5/00 Methods or arrangements for verifying the correctness of markings on a record carrier; Column-detection devices**

- 5/02 • the verifying forming a part of the marking action
- 5/04 • Verifying the alignment of markings

**7/00 Methods or arrangements for sensing record carriers**  
(G06K 9/00 takes precedence; methods or arrangements for marking the record carrier in digital fashion G06K 1/00)

- 7/01 • Details
- 7/015 • • Aligning or centring of the sensing device with respect to the record carrier
- 7/016 • • Synchronisation of sensing process
- 7/02 • by pneumatic or hydraulic means, e.g. sensing punched holes with compressed air; by sonic means
- 7/04 • by mechanical means, e.g. by pins operating electric contacts
- 7/06 • by means which conduct current when a mark is sensed or absent, e.g. contact brush for a conductive mark
- 7/08 • by means detecting the change of an electrostatic or magnetic field, e.g. by detecting change of capacitance between electrodes
- 7/10 • by electromagnetic radiation, e.g. optical sensing; by corpuscular radiation
- 7/12 • • using a selected wavelength, e.g. to sense red marks and ignore blue marks
- 7/14 • • using light without selection of wavelength, e.g. sensing reflected white light

**9/00 Methods or arrangements for reading or recognising printed or written characters or for recognising patterns, e.g. fingerprints** (methods or arrangements for graph-reading or for converting the pattern of mechanical parameters, e.g. force or presence, into electrical signals G06K 11/00; speech recognition G10L 15/00) [1, 7]

- 9/03 • Detection or correction of errors, e.g. by rescanning the pattern [3]
- 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
- 9/20 • Image acquisition [3]

- 9/22 • • using hand-held instruments [3]
- 9/24 • • • Construction of the instrument [3]
- 9/26 • • using a slot moved over the image [3]
- 9/28 • • using discrete sensing elements at predetermined points [3]
- 9/30 • • using automatic curve following means [3]
- 9/32 • • Aligning or centering of the image pick-up or image-field [3]
- 9/34 • • Segmentation of touching or overlapping patterns in the image field [3]
- 9/36 • Image preprocessing, i.e. processing the image information without deciding about the identity of the image [3]

**Note(s)**

Group G06K 9/58 takes precedence over groups G06K 9/38-G06K 9/54.

- 9/38 • • Quantising the analogue image signal [3]
- 9/40 • • Noise filtering [3]
- 9/42 • • Normalisation of the pattern dimensions [3]
- 9/44 • • Smoothing or thinning of the pattern [3]
- 9/46 • • Extraction of features or characteristics of the image [3]
- 9/48 • • • by coding the contour of the pattern [3]
- 9/50 • • • by analysing segments intersecting the pattern [3]
- 9/52 • • • by deriving mathematical or geometrical properties from the whole image [3]
- 9/54 • • Combinations of preprocessing functions [3]
- 9/56 • • • using a local operator, i.e. means to operate on an elementary image point in terms of the immediate surroundings of this point [3]
- 9/58 • • using optical means [3]
- 9/60 • Combination of image acquisition and preprocessing functions [3]
- 9/62 • Methods or arrangements for recognition using electronic means [3]
- 9/64 • • using simultaneous comparisons or correlations of the image signals with a plurality of references, e.g. resistor matrix [3]
- 9/66 • • • references adjustable by an adaptive method, e.g. learning [3]
- 9/68 • • using sequential comparisons of the image signals with a plurality of reference, e.g. addressable memory [3]
- 9/70 • • • the selection of the next reference depending on the result of the preceding comparison [3]
- 9/72 • • using context analysis based on the provisionally recognised identity of a number of successive patterns, e.g. a word [3]
- 9/74 • Arrangements for recognition using optical reference masks [3]
- 9/76 • • using holographic masks [3]
- 9/78 • Combination of image acquisition and recognition functions [3]
- 9/80 • Combination of image preprocessing and recognition functions [3]
- 9/82 • • using optical means in one or both functions [3]

**11/00 Methods or arrangements for graph-reading or for converting the pattern of mechanical parameters, e.g. force or presence, into electrical signals**  
(combined with character or pattern recognition G06K 9/00) [2]

- 11/02 • Automatic curve followers
- 11/04 • • using an auxiliary scanning pattern [2]

- 11/06 • Devices for converting the position of a manually-operated writing or tracing member into an electrical signal [3]

**13/00 Conveying record carriers from one station to another, e.g. from stack to punching mechanism**  
(conveying record carriers combined with another operation, e.g. with reading G06K 17/00)

- 13/02 • the record carrier having longitudinal dimension comparable with transverse dimension, e.g. punched card
- 13/04 • • Details, e.g. flaps in card-sorting apparatus
- 13/05 • • • Capstans; Pinch rollers
- 13/06 • • Guiding cards; Checking correct operation of card-conveying mechanisms [2]
- 13/063 • • • Aligning cards [2]
- 13/067 • • • Checking presence, absence, correct position, or moving status of cards [2]
- 13/07 • • Transporting of cards between stations
- 13/073 • • • with continuous movement [2]
- 13/077 • • • with intermittent movement; Braking or stopping movement [2]
- 13/08 • • Feeding or discharging cards
- 13/10 • • • from magazine to conveying arrangement
- 13/103 • • • • using mechanical means [2]
- 13/107 • • • • using pneumatic means [2]
- 13/12 • • • from conveying arrangement to magazine
- 13/14 • • • Card magazines, e.g. pocket, hopper
- 13/16 • • Handling flexible sheets, e.g. cheques
- 13/18 • the record carrier being longitudinally extended, e.g. punched tape
- 13/20 • • Details
- 13/22 • • • Capstans; Pinch rollers
- 13/24 • • Guiding of record carriers; Recognising end of record carrier
- 13/26 • • Winding-up or unwinding of record carriers; Driving of record carriers [2]
- 13/28 • • • continuously [2]
- 13/30 • • • intermittently [2]

**15/00 Arrangements for producing a permanent visual presentation of the output data** (printing or plotting combined with another operation, e.g. with conveying, G06K 17/00) [3]

- 15/02 • using printers
- 15/04 • • by rack-type printers
- 15/06 • • by type-wheel printers
- 15/07 • • • by continuously-rotating-type-wheel printers, e.g. rotating-type-drum printers [2]
- 15/08 • • by flight printing with type font moving in the direction of the printed line, e.g. chain printers
- 15/10 • • by matrix printers
- 15/12 • • by photographic printing
- 15/14 • • by electrographic printing, e.g. xerography; by magnetographic printing
- 15/16 • • Means for paper feeding or form feeding
- 15/22 • using plotters [3]

**17/00 Methods or arrangements for effecting co-operative working between equipments covered by two or more of main groups G06K 1/00-G06K 15/00, e.g. automatic card files incorporating conveying and reading operations**

**19/00 Record carriers for use with machines and with at least a part designed to carry digital markings**

- 19/02 • characterised by the selection of materials, e.g. to avoid wear during transport through the machine
- 19/04 • characterised by the shape
- 19/06 • characterised by the kind of the digital marking, e.g. shape, nature, code
- 19/063 • • the carrier being marginally punched or notched, e.g. having elongated slots [5]
- 19/067 • • Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards (using a coded card to authorise calls from a telephone set H04M 1/675) [5]
- 19/07 • • • with integrated circuit chips [5]
- 19/073 • • • Special arrangements for circuits, e.g. for protecting identification code in memory (protection against unauthorised use of computer memory G06F 12/14) [5]
- 19/077 • • • Constructional details, e.g. mounting of circuits in the carrier [5]
- 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
- 19/10 • • • at least one kind of marking being used for authentication, e.g. of credit or identity cards (verification of coded identity or credit cards in mechanisms actuated by them G07F 7/12) [5]
- 19/12 • • • the marking being sensed by magnetic means [5]
- 19/14 • • • the marking being sensed by radiation [5]
- 19/16 • • • the marking being a hologram or diffraction grating [5]
- 19/18 • • • Constructional details [5]
- 21/00 Information retrieval from punched cards designed for manual use or handling by machine**  
(G06K 19/00 takes precedence; detection or correction of errors by rescanning patterns G06K 9/03; checking correct operation of card-conveying mechanisms G06K 13/06); **Apparatus for handling such cards, e.g. marking or correcting**
- 21/02 • in which coincidence of markings is sensed mechanically, e.g. by needle
- 21/04 • in which coincidence of markings is sensed optically, e.g. peek-a-boo system
- 21/06 • Apparatus or tools adapted for slotting or otherwise marking information-retrieval cards
- 21/08 • Apparatus or tools for correcting punching or slotting errors [2]

**G06M COUNTING MECHANISMS; COUNTING OF OBJECTS NOT OTHERWISE PROVIDED FOR** (counting by measuring volume or weight of articles to be counted G01F, G01G; adaptation of counters to electricity meters in electromechanical arrangements for measuring time integral of electric power or current G01R 11/16; computers G06C-G06J; counting electric pulses H03K; counting characters, words or messages in switching networks for transmission of digital information H04L 12/08; metering arrangements in telephonic systems H04M 15/00)

#### Note(s)

This subclass covers:

- stepping or continuously-moving mechanical counters operated through one or more inputs applied to the lowest order mechanically or electrically;
- counting systems involving applications of either mechanical, electrical, or electronic counters.

#### 1/00 Design features of general application

- 1/02 • Housing (for measuring instruments in general G01D)
- 1/04 • for driving the stage of lowest order (with variable ratio of drive G06M 1/38)
- 1/06 • • producing continuous revolution of the stage, e.g. with gear train
- 1/08 • for actuating the drive
- 1/10 • • by electric or magnetic means
- 1/12 • • by fluid means
- 1/14 • for transferring a condition from one stage to a higher stage (with variable ratio of transfer G06M 1/38)
- 1/16 • • self-operating, e.g. by Geneva mechanism
- 1/18 • • requiring external operation, e.g. by electromagnetic force
- 1/20 • • specially adapted for denominations with unequal numbers in each stage, e.g. degrees and minutes of angle
- 1/22 • for visual indication of the result of count on counting mechanisms, e.g. by window with magnifying lens
- 1/24 • • Drums; Dials; Pointers
- 1/26 • • Aligning means
- 1/27 • for representing the result of count in the form of electric signals, e.g. by sensing markings on the counter drum

- 1/272 • • using photoelectric means
- 1/274 • • using magnetic means; using Hall-effect devices
- 1/276 • • using mechanically-actuated contacts
- 1/28 • for zeroising or setting to a particular value
- 1/30 • • using heart-shaped or similar cams; using levers
- 1/32 • • • Actuating means, e.g. magnet, spring, weight
- 1/34 • • using reset shafts
- 1/36 • • • Actuating means, e.g. magnet, spring, weight
- 1/38 • for varying ratio of drive or transfer mechanism, e.g. by using alternative counting trains

#### 3/00 Counters with additional facilities (generating electric pulses at random intervals H03K 3/84)

- 3/02 • for performing an operation at a predetermined value of the count, e.g. arresting a machine
- 3/04 • • with an additional counter train operating in the reverse direction
- 3/06 • for printing or separately displaying result of count (display systems G09)
- 3/08 • for counting the input from several sources; for counting inputs of different amounts
- 3/10 • for counting denominations with unequal numbers in each stage, e.g. degrees and minutes of angle (transfer mechanism therefor G06M 1/20)
- 3/12 • for preventing incorrect actuation, e.g. for preventing falsification

**G06M**

- 3/14 • for registering difference of positive and negative actuations

**Counting of objects**

- 7/00 Counting of objects carried by a conveyor**  
 7/02 • wherein objects ahead of the sensing element are separated to produce a distinct gap between successive objects  
 7/04 • • Counting of piece goods, e.g. of boxes  
 7/06 • • Counting of flat articles, e.g. of sheets of paper  
 7/08 • wherein the direction of movement of the objects is changed at the station where they are sensed  
 7/10 • • Counting of flat overlapped articles, e.g. of cards

**9/00 Counting of objects in a stack thereof**

- 9/02 • by using a rotating separator incorporating pneumatic suction nozzles  
 11/00 **Counting of objects distributed at random, e.g. on a surface**  
 11/02 • using an electron beam scanning a surface line by line, e.g. of blood cells on a substrate  
 11/04 • • with provision for distinguishing between different sizes of objects (investigating particle size in general G01N 15/00)

**15/00 Counting of objects, not otherwise provided for [2011.01]****G06N COMPUTER SYSTEMS BASED ON SPECIFIC COMPUTATIONAL MODELS [7]**

- 3/00 Computer systems based on biological models** (analogue computers simulating functional aspects of living beings G06G 7/60) [7]  
 3/02 • using neural network models (for adaptive control G05B 13/00; for image pattern matching G06K 9/00; for image data processing G06T 1/40; for phonetic pattern matching G10L 15/16) [7]  
 3/04 • • Architecture, e.g. interconnection topology [7]  
 3/06 • • Physical realisation, i.e. hardware implementation of neural networks, neurons or parts of neurons [7]  
 3/063 • • • using electronic means [7]  
 3/067 • • • using optical means [7]  
 3/08 • • Learning methods [7]  
 3/10 • • Simulation on general purpose computers [7]  
 3/12 • using genetic models [7]

**5/00 Computer systems utilizing knowledge based models [7]**

- 5/02 • Knowledge representation [7]  
 5/04 • Inference methods or devices [7]

**7/00 Computer systems based on specific mathematical models [7]**

- 7/02 • using fuzzy logic (G06N 3/00, G06N 5/00 take precedence; for adaptive control G05B 13/00) [7]  
 7/04 • • Physical realisation [7]  
 7/06 • • Simulation on general purpose computers [7]  
 7/08 • using chaos models or non-linear system models [7]

**99/00 Subject matter not provided for in other groups of this subclass [2010.01]****G06Q DATA PROCESSING SYSTEMS OR METHODS, SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING PURPOSES; SYSTEMS OR METHODS SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING PURPOSES, NOT OTHERWISE PROVIDED FOR [2006.01]****Note(s) [2006.01]**

- Groups G06Q 10/00-G06Q 50/00 and G06Q 99/00 only cover systems or methods that involve significant data processing operations, i.e. data processing operations that need to be carried out by a technological, e.g. computing, system or device. Group G06Q 90/00 covers systems or methods that do not involve significant data processing, when both of the following conditions are fulfilled:
  - the systems or methods are specially adapted for the purposes mentioned in the subclass title or the titles of groups G06Q 10/00-G06Q 50/00; and
  - the systems or methods cannot be classified elsewhere in the IPC, for example by applying the principles described in paragraph 96 of the Guide.

When classifying such systems or methods in group G06Q 90/00, additional classification may be made in the most closely related group of this or any other subclass, if this classification gives information about the application of the systems or methods that could be of interest for search. Such non-obligatory classification must be given as "additional information".
- When classifying in groups G06Q 10/00-G06Q 40/00, systems or methods that are specially adapted for a specific business sector must also be classified in group G06Q 50/00, when the special adaptation is determined to be novel and non-obvious.
- In this subclass, the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place.

**10/00 Administration; Management [2006.01, 2012.01]**

- 10/02 • Reservations, e.g. for tickets, services or events [2012.01]  
 10/04 • Forecasting or optimisation, e.g. linear programming, "travelling salesman problem" or "cutting stock problem" [2012.01]

- 10/06 • Resources, workflows, human or project management, e.g. organising, planning, scheduling or allocating time, human or machine resources; Enterprise planning; Organisational models [2012.01]  
 10/08 • Logistics, e.g. warehousing, loading, distribution or shipping; Inventory or stock management, e.g. order filling, procurement or balancing against orders [2012.01]

10/10	<ul style="list-style-type: none"> <li>Office automation, e.g. computer aided management of electronic mail or groupware (electronic mail network systems H04L 12/58; electronic mail protocols H04L 29/06); Time management, e.g. calendars, reminders, meetings or time accounting [2012.01]</li> </ul>	30/00	<b>Commerce, e.g. shopping or e-commerce [2006.01, 2012.01]</b>
20/00	<b>Payment architectures, schemes or protocols</b> (apparatus for performing or posting payment transactions G07F 7/08, G07F 19/00; electronic cash registers G07G 1/12) [2006.01, 2012.01]	30/02	<ul style="list-style-type: none"> <li>Marketing, e.g. market research and analysis, surveying, promotions, advertising, buyer profiling, customer management or rewards; Price estimation or determination [2012.01]</li> </ul>
	<b>Note(s) [2006.01]</b>	30/04	<ul style="list-style-type: none"> <li>Billing or invoicing [2012.01]</li> </ul>
	This group covers:	30/06	<ul style="list-style-type: none"> <li>Buying, selling or leasing transactions [2012.01]</li> </ul>
	<ul style="list-style-type: none"> <li>protocols or schemes which include procedures whereby a payment is made between a merchant, a bank, a user and sometimes a third party; the procedure usually includes verification and authentication of all parties involved.</li> </ul>	30/08	<ul style="list-style-type: none"> <li>• Auctions [2012.01]</li> </ul>
20/02	<ul style="list-style-type: none"> <li>involving a neutral third party, e.g. certification authority, notary or trusted third party [TTP] [2012.01]</li> </ul>	40/00	<b>Finance; Insurance; Tax strategies; Processing of corporate or income taxes [2006.01, 2012.01]</b>
20/04	<ul style="list-style-type: none"> <li>Payment circuits [2012.01]</li> </ul>	40/02	<ul style="list-style-type: none"> <li>Banking, e.g. interest calculation, credit approval, mortgages, home banking or on-line banking [2012.01]</li> </ul>
20/06	<ul style="list-style-type: none"> <li>• Private payment circuits, e.g. involving electronic currency used only among participants of a common payment scheme [2012.01]</li> </ul>	40/04	<ul style="list-style-type: none"> <li>Exchange, e.g. stocks, commodities, derivatives or currency exchange [2012.01]</li> </ul>
20/08	<ul style="list-style-type: none"> <li>Payment architectures [2012.01]</li> </ul>	40/06	<ul style="list-style-type: none"> <li>Investment, e.g. financial instruments, portfolio management or fund management [2012.01]</li> </ul>
20/10	<ul style="list-style-type: none"> <li>• specially adapted for electronic funds transfer [EFT] systems; specially adapted for home banking systems [2012.01]</li> </ul>	40/08	<ul style="list-style-type: none"> <li>Insurance, e.g. risk analysis or pensions [2012.01]</li> </ul>
20/12	<ul style="list-style-type: none"> <li>• specially adapted for electronic shopping systems [2012.01]</li> </ul>	50/00	<b>Systems or methods specially adapted for a specific business sector, e.g. utilities or tourism [2006.01, 2012.01]</b>
20/14	<ul style="list-style-type: none"> <li>• specially adapted for billing systems [2012.01]</li> </ul>	50/02	<ul style="list-style-type: none"> <li>Agriculture; Fishing; Mining [2012.01]</li> </ul>
20/16	<ul style="list-style-type: none"> <li>• Payments settled via telecommunication systems [2012.01]</li> </ul>	50/04	<ul style="list-style-type: none"> <li>Manufacturing [2012.01]</li> </ul>
20/18	<ul style="list-style-type: none"> <li>• involving self-service terminals [SSTs], vending machines, kiosks or multimedia terminals [2012.01]</li> </ul>	50/06	<ul style="list-style-type: none"> <li>Electricity, gas or water supply [2012.01]</li> </ul>
20/20	<ul style="list-style-type: none"> <li>• Point-of-sale [POS] network systems [2012.01]</li> </ul>	50/08	<ul style="list-style-type: none"> <li>Construction [2012.01]</li> </ul>
20/22	<ul style="list-style-type: none"> <li>Payment schemes or models [2012.01]</li> </ul>	50/10	<ul style="list-style-type: none"> <li>Services [2012.01]</li> </ul>
20/24	<ul style="list-style-type: none"> <li>• Credit schemes, i.e. "pay after" [2012.01]</li> </ul>	50/12	<ul style="list-style-type: none"> <li>• Hotels or restaurants [2012.01]</li> </ul>
20/26	<ul style="list-style-type: none"> <li>• Debit schemes, i.e. "pay now" [2012.01]</li> </ul>	50/14	<ul style="list-style-type: none"> <li>• Travel agencies [2012.01]</li> </ul>
20/28	<ul style="list-style-type: none"> <li>• Pre-payment schemes, i.e. "pay before" [2012.01]</li> </ul>	50/16	<ul style="list-style-type: none"> <li>• Real estate [2012.01]</li> </ul>
20/30	<ul style="list-style-type: none"> <li>characterised by the use of specific devices [2012.01]</li> </ul>	50/18	<ul style="list-style-type: none"> <li>• Legal services; Handling legal documents [2012.01]</li> </ul>
20/32	<ul style="list-style-type: none"> <li>• using wireless devices [2012.01]</li> </ul>	50/20	<ul style="list-style-type: none"> <li>• Education [2012.01]</li> </ul>
20/34	<ul style="list-style-type: none"> <li>• using cards, e.g. integrated circuit [IC] cards or magnetic cards [2012.01]</li> </ul>	50/22	<ul style="list-style-type: none"> <li>• Health care, e.g. hospitals; Social work [2012.01]</li> </ul>
20/36	<ul style="list-style-type: none"> <li>• using electronic wallets or electronic money safes [2012.01]</li> </ul>	50/24	<ul style="list-style-type: none"> <li>• Patient record management (processing of medical or biological data for scientific purposes G06F 19/00) [2012.01]</li> </ul>
20/38	<ul style="list-style-type: none"> <li>Payment protocols; Details thereof [2012.01]</li> </ul>	50/26	<ul style="list-style-type: none"> <li>• Government or public services [2012.01]</li> </ul>
20/40	<ul style="list-style-type: none"> <li>• Authorisation, e.g. identification of payer or payee, verification of customer or shop credentials; Review and approval of payers, e.g. check of credit lines or negative lists [2012.01]</li> </ul>	50/28	<ul style="list-style-type: none"> <li>Logistics, e.g. warehousing, loading, distribution or shipping [2012.01]</li> </ul>
20/42	<ul style="list-style-type: none"> <li>• Confirmation, e.g. check or permission by the legal debtor of payment [2012.01]</li> </ul>	50/30	<ul style="list-style-type: none"> <li>Transportation; Communications [2012.01]</li> </ul>
		50/32	<ul style="list-style-type: none"> <li>• Post and telecommunications (franking apparatus G07B 17/00) [2012.01]</li> </ul>
		50/34	<ul style="list-style-type: none"> <li>Betting or bookmaking, e.g. Internet betting [2012.01]</li> </ul>
		90/00	<b>Systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes, not involving significant data processing [2006.01]</b>
		99/00	<b>Subject matter not provided for in other groups of this subclass [2006.01]</b>
<b>G06T</b>	<b>IMAGE DATA PROCESSING OR GENERATION, IN GENERAL</b> (specially adapted for particular applications, <u>see</u> the relevant subclasses, e.g. G01C, G06K, G09G, H04N) [6, 2006.01]		

**Note(s)**

- This subclass covers:
  - arrangements for geometrically modelling objects, whether the final model is used for display of an image of the object or for some other purpose, such as manufacture of a corresponding object;

- arrangements for analysing the geometric attributes of an image of an object.
- 2. This subclass does not cover:
  - photogrammetry or videogrammetry, which are covered by subclass G01C;
  - reading or recognising printed or written characters or recognising patterns, e.g. fingerprints, which is covered by subclass G06K;
  - modification of image data to allow display using multiple viewports, which is covered by subclass G09G;
  - circuits for generating functions for visual indicators, which are covered by subclass G09G;
  - scanning of documents or the like in pictorial communication, which is covered by subclass H04N.

### Subclass index

GENERAL PURPOSE IMAGE DATA PROCESSING.....	1/00
GEOMETRIC IMAGE TRANSFORMATION IN THE PLANE OF THE IMAGE.....	3/00
IMAGE ENHANCEMENT OR RESTORATION.....	5/00
IMAGE ANALYSIS.....	7/00
IMAGE CODING.....	9/00
2D [TWO DIMENSIONAL] IMAGE GENERATION.....	11/00
ANIMATION.....	13/00
3D [THREE DIMENSIONAL] IMAGE RENDERING.....	15/00
3D MODELLING FOR COMPUTER GRAPHICS.....	17/00
MANIPULATING 3D MODELS OR IMAGES FOR COMPUTER GRAPHICS.....	19/00

<b>1/00</b>	<b>General purpose image data processing [6]</b>	<b>11/80</b>	• Creating or modifying a manually drawn or painted image using a manual input device, e.g. mouse, light pen, direction keys on keyboard [6]
1/20	• Processor architectures; Processor configuration, e.g. pipelining (architectures of general purpose stored programme computers G06F 15/76) [6]		
1/40	• • Neural networks [6]	<b>13/00</b>	<b>Animation [6, 2011.01]</b>
1/60	• Memory management [6]	13/20	• 3D [Three Dimensional] animation [2011.01]
		13/40	• • of characters, e.g. humans, animals or virtual beings [2011.01]
<b>3/00</b>	<b>Geometric image transformation in the plane of the image, e.g. from bit-mapped to bit-mapped creating a different image [6]</b>	13/60	• • of natural phenomena, e.g. rain, snow, water or plants [2011.01]
3/20	• Linear translation of a whole image or part thereof, e.g. panning [6]	13/80	• 2D animation, e.g. using sprites [2011.01]
3/40	• Scaling of a whole image or part thereof [6]	<b>15/00</b>	<b>3D [Three Dimensional] image rendering [6, 2011.01]</b>
3/60	• Rotation of a whole image or part thereof [6]	15/02	• Non-photorealistic rendering [2011.01]
		15/04	• Texture mapping [2011.01]
<b>5/00</b>	<b>Image enhancement or restoration, e.g. from bit-mapped to bit-mapped creating a similar image [6]</b>	15/06	• Ray-tracing [2011.01]
5/10	• by non-spatial domain filtering [6]	15/08	• Volume rendering [2011.01]
5/20	• by the use of local operators [6]	15/10	• Geometric effects [6, 2011.01]
5/30	• • Erosion or dilatation, e.g. thinning [6]	15/20	• • Perspective computation [6, 2011.01]
5/40	• by the use of histogram techniques [6]	15/30	• • Clipping [6, 2011.01]
5/50	• by the use of more than one image, e.g. averaging, subtraction [6]	15/40	• • Hidden part removal [6, 2011.01]
		15/50	• Lighting effects [6, 2011.01]
<b>7/00</b>	<b>Image analysis, e.g. from bit-mapped to non bit-mapped [6]</b>	15/55	• • Radiosity [2011.01]
7/20	• Analysis of motion [6]	15/60	• • Shadow generation [6]
7/40	• Analysis of texture [6]	15/80	• • Shading [2011.01]
7/60	• Analysis of geometric attributes, e.g. area, centre of gravity, perimeter, from an image [6]	15/83	• • • Phong shading [2011.01]
		15/87	• • • Gouraud shading [2011.01]
<b>9/00</b>	<b>Image coding, e.g. from bit-mapped to non bit-mapped (compression in general H03M; compression for image communication H04N) [6]</b>	<b>17/00</b>	<b>3D modelling for computer graphics [6]</b>
9/20	• Contour coding, e.g. using detection of edges [6]	17/05	• Geographic models [2011.01]
9/40	• Tree coding, e.g. quadtree, octree [6]	17/10	• Volume description, e.g. cylinders, cubes or using CSG [Constructive Solid Geometry] [6]
		17/20	• Wire-frame description, e.g. polygonalisation or tessellation [6]
<b>11/00</b>	<b>2D [Two Dimensional] image generation [6]</b>	17/30	• Surface description, e.g. polynomial surface description [6]
11/20	• Drawing from basic elements, e.g. lines or circles [6]	<b>19/00</b>	<b>Manipulating 3D models or images for computer graphics [2011.01]</b>
11/40	• Filling a planar surface by adding surface attributes, e.g. colour or texture [6]	19/20	• Editing of 3D images, e.g. changing shapes or colours, aligning objects or positioning parts [2011.01]
11/60	• Editing figures and text; Combining figures or text [6]		

**G07 CHECKING-DEVICES****G07B TICKET-ISSUING APPARATUS; TAXIMETERS; ARRANGEMENTS OR APPARATUS FOR COLLECTING FARES, TOLLS OR ENTRANCE FEES AT ONE OR MORE CONTROL POINTS; FRANKING APPARATUS****Subclass index**

MACHINES FOR PRINTING OR ISSUING TICKETS; DETAILS THEREOF.....	1/00, 3/00, 5/00
OTHER APPARATUS OR SYSTEMS CONCERNING TICKETS	
Holders; punches; validating; cancelling.....	7/00, 9/00, 11/00
TAXIMETERS.....	13/00
ARRANGEMENTS OR APPARATUS FOR COLLECTING FARES, TOLLS OR ENTRANCE FEES AT ONE OR MORE CONTROL POINTS.....	15/00
FRANKING APPARATUS.....	17/00

<b>1/00</b>	<b>Machines for printing and issuing tickets</b>	<b>13/10</b>	• • • automatically actuated
1/02	• employing selectable printing plates		
1/04	• • wherein the plates are inserted	<b>15/00</b>	<b>Arrangements or apparatus for collecting fares, tolls or entrance fees at one or more control points</b>
1/06	• without selectable printing plates		(handling coins or paper currency G07D; apparatus for vending or hiring articles or services activated by coins, credit cards, paper currency or the like G07F 7/00, G07F 17/00) [1, 2011.01]
1/08	• portable		
<b>3/00</b>	<b>Machines for issuing preprinted tickets</b>		<b>Note(s) [2011.01]</b>
3/02	• from stock in wound strip form		Data processing aspects of payment systems or protocols relating to toll, entrance fee or fare collection, e.g. in road pricing or congestion charging, are also classified in G06Q 20/00.
3/04	• from a stack		
<b>5/00</b>	<b>Details of, or auxiliary devices for, ticket-issuing machines</b> (for validating inserted tickets G07B 11/02)	<b>15/02</b>	• taking into account a variable factor such as distance or time, e.g. for passenger transport, parking systems or car rental systems (G07B 15/06 takes precedence; taximeters G07B 13/00; parking meters <u>per se</u> G07F 17/24) [1, 2011.01]
5/02	• for cutting-off or separating tickets		
5/04	• for recording or registering tickets issued	<b>15/04</b>	• • comprising devices to free a barrier, turnstile, or the like (turnstile with registering means G07C 9/02)
5/06	• for preventing fraudulent operation		
5/08	• for avoiding incorrect action of the machine	<b>15/06</b>	• Arrangements for road pricing or congestion charging of vehicles or vehicle users, e.g. automatic toll systems [2011.01]
5/10	• • indicating when ticket supply is exhausted		
5/12	• allowing manual writing on the tickets		<b>Note(s) [2011.01]</b>
<b>7/00</b>	<b>Holders providing direct manual access to the tickets</b>		This group covers the identification or tracking of vehicles or vehicle users for the purpose of road pricing or congestion charging, which means that vehicles or vehicle users are not necessarily channelled through fixed control points, e.g. toll booths or overhead gantries, but may be detected at a number of places when they travel in normal fashion in a pre-defined locality, e.g. a defined area in a city centre or an expressway, and where the information so generated is then used to determine a charge to be paid.
<b>9/00</b>	<b>Ticket punches</b> (punching or perforating pliers B26F 1/36)		
9/02	• Toy ticket-punches		
<b>11/00</b>	<b>Apparatus for validating or cancelling issued tickets [2]</b>		
11/02	• for validating inserted tickets		
11/03	• • by printing [2]		
11/05	• • by perforating [2]		
11/07	• • by separating part of ticket [2]		
11/09	• • • combined with receptacle for separated part of ticket [2]		
11/11	• for cancelling tickets [2]		
<b>13/00</b>	<b>Taximeters</b>	<b>17/00</b>	<b>Franking apparatus</b>
13/02	• Details; Accessories	17/02	• with means for computing or counting
13/04	• • for indicating fare or state of hire	17/04	• with means for avoiding misuse
13/06	• • Driving arrangements		
13/08	• • Tariff-changing arrangements		

**G07C TIME OR ATTENDANCE REGISTERS; REGISTERING OR INDICATING THE WORKING OF MACHINES; GENERATING RANDOM NUMBERS; VOTING OR LOTTERY APPARATUS; ARRANGEMENTS, SYSTEMS, OR APPARATUS FOR CHECKING NOT PROVIDED FOR ELSEWHERE** (identification of persons, e.g. finger-printing, foot-printing, A61B 5/117; indicating or recording apparatus for measuring in general, analogous apparatus but in which the input is not a variable to be measured, e.g. a hand operation, G01D; clocks, clock mechanisms G04B, G04C; time-interval measuring G04F; counting mechanisms per se G06M)

### Subclass index

REGISTERING TIME OF EVENTS OR ELAPSED TIME.....	1/00
REGISTERING THE WORKING OF MACHINES; OF VEHICLES; DETAILS THEREOF.....	3/00, 5/00, 7/00
INDIVIDUAL ENTRY OR EXIT REGISTERS.....	9/00
CHECKING APPARATUS NOT PROVIDED FOR ELSEWHERE.....	11/00
VOTING APPARATUS; GENERATING RANDOM NUMBERS, LOTTERY APPARATUS.....	13/00, 15/00

<b>1/00</b>	<b>Registering, indicating, or recording the time of events or elapsed time, e.g. time-recorders for work people</b> (registering or indicating the working of machines or vehicles G07C 3/00, G07C 5/00)	3/02	• Registering or indicating working or idle time only
	<b>Note(s)</b>	3/04	• • using counting means or digital clocks
	Groups G07C 1/20-G07C 1/32 take precedence over groups G07C 1/02-G07C 1/10.	3/06	• • in graphical form
1/02	• not involving the registering, indicating, or recording of other data	3/08	• Registering or indicating the production of the machine either with or without registering working or idle time
1/04	• • wherein the time is indicated in figures	3/10	• • using counting means
1/06	• • • with apparatus adapted for use with individual cards	3/12	• • in graphical form
1/08	• • wherein the time is indicated by marking an element, e.g. a card or tape, in a position determined by the time	3/14	• Quality control systems
1/10	• together with the recording, indicating, or registering of other data, e.g. of signs of identity (together with the recording of a continuously-varying variable G01D or the appropriate other subclass of class G01, dependent on the variable)	<b>5/00</b>	<b>Registering or indicating the working of vehicles</b> (for measuring distance travelled or combinations of speed and distance G01C; engine indicators G01L; devices for measuring speed or acceleration G01P; apparatus forming part of taximeters G07B)
1/12	• • wherein the time is indicated in figures	5/02	• Registering or indicating driving, working, idle, or waiting time only
1/14	• • • with apparatus adapted for use with individual cards	5/04	• • using counting means or digital clocks
1/16	• • wherein the time is indicated by marking an element, e.g. a card or tape, in a position determined by the time	5/06	• • in graphical form
1/18	• • • with apparatus adapted for use with individual cards	5/08	• Registering or indicating performance data other than driving, working, idle, or waiting time, with or without registering driving, working, idle, or waiting time
1/20	• Checking timed patrols, e.g. of watchman	5/10	• • using counting means or digital clocks
1/22	• in connection with sports or games	5/12	• • in graphical form
1/24	• Race time-recorders (race-finish cameras G03B 41/00)	<b>7/00</b>	<b>Details or accessories common to the registering or indicating apparatus of groups G07C 3/00 and G07C 5/00</b>
1/26	• • Pigeon-timing or like equipment	<b>9/00</b>	<b>Individual entry or exit registers</b>
1/28	• • Indicating playing time	9/02	• Turnstiles with registering means (coin-freed aspects G07F)
1/30	• Parking meters (registering or indicating waiting time of vehicles by means driven by the vehicle G07C 5/02; coin-freed parking meters G07F 17/24)	<b>11/00</b>	<b>Arrangements, systems, or apparatus for checking, e.g. the occurrence of a condition, not provided for elsewhere</b> (for checking lotto or bingo games A63F 3/06; signalling or alarm arrangements G08B)
1/32	• Time-recording locks (locks giving indication of unauthorised unlocking E05B 39/00)	<b>13/00</b>	<b>Voting apparatus</b>
<b>3/00</b>	<b>Registering or indicating the condition or the working of machines or other apparatus, other than vehicles</b> (engine indicators G01L; testing apparatus incident to its manufacture G01M; signalling arrangements <u>per se</u> , indicating undesired or abnormal working conditions G08B)	13/02	• Ballot boxes
		<b>15/00</b>	<b>Generating random numbers; Lottery apparatus</b> (digital computer arrangements for generating random or pseudo-random numbers G06F 7/58; generating electric pulses at random intervals H03K 3/84) [3]

**G07D HANDLING OF COINS OR OF PAPER CURRENCY OR SIMILAR VALUABLE PAPERS, e.g. TESTING, SORTING BY DENOMINATIONS, COUNTING, DISPENSING, CHANGING OR DEPOSITING [2]**

**Note(s)**

In this subclass, the following terms or expressions are used with the meaning indicated:

- "coins" also covers tokens of similar nature;
- "paper currency or similar valuable papers" covers banknotes, bills, cheques, vouchers, securities, bonds or the like.

**1/00 Coin dispensers**

- 1/02 • giving change
- 1/04 • • dispensing change equal to a sum deposited
- 1/06 • • dispensing the difference between a sum paid and a sum charged
- 1/08 • • hand actuated

**3/00 Sorting a mixed bulk of coins into denominations [1, 7]**

- 3/02 • Sorting coins by means of graded apertures
- 3/04 • • arranged on an inclined rail
- 3/06 • • arranged along a circular path
- 3/08 • • arranged on a helix
- 3/10 • • provided by sieves arranged in series
- 3/12 • Sorting coins by means of stepped deflectors
- 3/14 • Apparatus driven under control of coin-sensing elements
- 3/16 • in combination with coin-counting

**5/00 Testing specially adapted to determine the identity or genuineness of coins, e.g. for segregating coins which are unacceptable or alien to a currency [1, 7]**

**Note(s)**

In groups G07D 5/02-G07D 5/10, in the absence of an indication to the contrary, classification is made in the last appropriate place.

- 5/02 • Testing the dimensions, e.g. thickness, diameter; Testing the deformation [3]
- 5/04 • Testing the weight [3]
- 5/06 • Testing the hardness or elasticity [3]
- 5/08 • Testing the magnetic or electric properties [3]
- 5/10 • Testing the rim, e.g. the milling of the rim [3]

**7/00 Testing specially adapted to determine the identity or genuineness of paper currency or similar valuable papers, e.g. for segregating those which are unacceptable or alien to a currency [2]**

**Note(s)**

Groups G07D 7/16-G07D 7/20 take precedence over groups G07D 7/02-G07D 7/14

- 7/02 • using electric means (G07D 7/04, G07D 7/06 take precedence) [7]
- 7/04 • using magnetic means, e.g. detection of magnetic imprint [7]
- 7/06 • using wave or particle radiation [7]
- 7/08 • • Acoustic waves [7]
- 7/10 • • Microwaves [7]
- 7/12 • • Visible light, infra-red or ultra-violet radiation [7]
- 7/14 • using chemical means [7]
- 7/16 • Testing the dimensions [7]
- 7/18 • Testing the stiffness [7]
- 7/20 • Testing patterns thereon [7]

**9/00 Counting coins (in combination with coin-sorting G07D 3/16); Handling of coins not provided for in the other groups of this subclass**

- 9/02 • Change trays
- 9/04 • Hand- or motor-driven devices for counting coins
- 9/06 • Devices for stacking or otherwise arranging coins on a support, e.g. apertured plate for use in counting coins

**11/00 Devices accepting coins or paper currency, e.g. depositing machines (apparatus freed or actuated by coins or the like G07F; apparatus freed or actuated by paper currency G07F 7/04; complete banking systems G07F 19/00) [5]**

**13/00 Handling of coins or of paper currency or similar valuable papers, characterised by a combination of mechanisms not covered by a single one of groups G07D 1/00-G07D 11/00 [5]**

**G07F COIN-FREED OR LIKE APPARATUS (coin sorting G07D 3/00; coin testing G07D 5/00) [1, 7]**

**Note(s)**

1. This subclass does not cover constructions or details of apparatus which includes, or is combined with, coin-actuated mechanisms but is not specially adapted or modified for use therewith. Such constructions or details are covered by the relevant subclass for the particular apparatus.
2. In this subclass, the following term is used with the meaning indicated:
  - "coins" covers also tokens or the like.

**Subclass index**

**ARRANGEMENTS OR MECHANISMS IN GENERAL**

Coin inlet; coin actuation; others.....1/00, 5/00, 7/00

**APPARATUS CHARACTERISED BY THE APPLICATION**

Dispensing; metering; hiring.....11/00, 13/00, 15/00, 17/00

COMPLETE BANKING SYSTEMS.....19/00

<b>1/00</b>	<b>Coin inlet arrangements; Coins specially adapted to operate coin-freed mechanisms</b>	11/04	• • in which magazines the articles are stored one vertically above the other
1/02	• Coin slots	11/06	• • • supported individually on pivotally-mounted flaps or shelves
1/04	• Coin chutes	11/08	• • • arranged in two columns in staggered relationship
1/06	• Coins specially adapted to operate coin-freed mechanisms	11/10	• • • two or more magazines having a common delivery chute
<b>5/00</b>	<b>Coin-actuated mechanisms; Interlocks</b>	11/12	• • • with means for automatically changing to reserve stacks
5/02	• actuated mechanically by coins, e.g. by a single coin	11/14	• • • with means for raising the stack of articles to permit delivery of the topmost
5/04	• • wherein two or more coins of the same denomination are required for each transaction	11/16	• • • Delivery means
5/06	• • wherein two or more coins of different denominations are required for each transaction	11/18	• • • • Recessed drawers
5/08	• • wherein the use of two or more coins or an equivalent single coin is optional for each transaction; wherein the use of two or more coins or an alternative equivalent combination of coins is optional for each transaction	11/20	• • • • Pushers actuated directly by hand
5/10	• actuated electrically by the coin, e.g. by a single coin	11/22	• • • • Pushers actuated indirectly by hand, e.g. through cranks or levers
5/12	• • wherein two or more coins of the same denomination are required for each transaction	11/24	• • • • Rotary or oscillatory members
5/14	• • wherein two or more coins of different denominations are required for each transaction	11/26	• • • • Endless bands
5/16	• • wherein the use of two or more coins or an equivalent single coin is optional for each transaction; wherein the use of two or more coins or an alternative equivalent combination of coins is optional for each transaction	11/28	• • in which the magazines are inclined
5/18	• specially adapted for controlling several coin-freed apparatus from one place	11/30	• • • two or more magazines having independent delivery
5/20	• specially adapted for registering coins as credit, e.g. mechanically actuated	11/32	• • • two or more magazines having a common delivery chute
5/22	• • electrically actuated	11/34	• • in which the magazines are of zig-zag form
5/24	• with change-giving	11/36	• • in which the magazines are of helical or spiral form
5/26	• Interlocks, e.g. for locking the doors of compartments other than that to be used	11/38	• • in which the magazines are horizontal
<b>7/00</b>	<b>Mechanisms actuated by objects other than coins to free or to actuate vending, hiring, coin or paper currency dispensing or refunding apparatus [2]</b>	11/40	• • • the articles being delivered by hand-operated means
7/02	• by keys or other credit registering devices [2]	11/42	• • • the articles being delivered by motor-driven means
7/04	• by paper currency	11/44	• • in which magazines the articles are stored in bulk
7/06	• by returnable containers, e.g. bottles	11/46	• from movable storage containers or supports
7/08	• by coded identity card or credit card [2]	11/48	• • the storage containers or supports, e.g. magazine, being pivotally mounted
7/10	• • together with a coded signal [2]	11/50	• • the storage containers or supports being rotatably mounted
7/12	• • Card verification [5]	11/52	• • • about horizontal axes
<b>9/00</b>	<b>Details other than those peculiar to special kinds or types of apparatus (coin inlet arrangements G07F 1/00; coin-actuated mechanisms, interlocks G07F 5/00)</b>	11/54	• • • about vertical axes
9/02	• Devices for alarm or indication, e.g. when empty; Advertising arrangements in coin-freed apparatus (alarms or warning devices indicating the interruption of flow to be metered G07F 15/10)	11/56	• • • • the storage containers or supports both rotating and moving axially
9/04	• Means for returning surplus or unused coins	11/58	• • the articles being supported on or by endless belts or like conveyors
9/06	• Coin boxes	11/60	• • the storage containers or supports being rectilinearly movable
9/08	• Counting total of coins inserted	11/62	• in which the articles are stored in compartments in fixed receptacles
9/10	• Casings, e.g. with means for heating or cooling	11/64	• in which the articles are individually suspended from stationary supports
<b>11/00</b>	<b>Coin-freed apparatus for dispensing, or the like, discrete articles</b>	11/66	• in which the articles are dispensed by cutting from a mass
11/02	• from non-movable magazines	11/68	• in which the articles are torn or severed from strips or sheets
		11/70	• in which the articles are formed in the apparatus from components, blanks, or material constituents
		11/72	• Auxiliary equipments, e.g. for lighting cigars, opening bottles
		<b>13/00</b>	<b>Coin-freed apparatus for controlling dispensing of fluids, semiliquids or granular material from reservoirs</b>

- 13/02 • by volume
- 13/04 • by weight
- 13/06 • with selective dispensing of different fluids or materials or mixtures thereof
- 13/08 • in the form of a spray
- 13/10 • with associated dispensing of containers, e.g. cups or other articles
- 15/00 Coin-free apparatus with meter-controlled dispensing of liquid, gas, or electricity**
- 15/02 • in which the quantity mechanism is set forward by hand after insertion of a coin
- 15/04 • in which the quantity mechanism is set forward automatically by the insertion of a coin
- 15/06 • with means for prepaying basic charges, e.g. rent for meters
- 15/08 • with means for varying the tariff or changing the price
- 15/10 • with alarm or warning devices, e.g. indicating the interrupting of the supply
- 15/12 • in which metering is on a time basis
- 17/00 Coin-free apparatus for hiring articles; Coin-free facilities or services**
- 17/02 • for optical devices, e.g. telescopes
- 17/04 • for anthropometrical measurements such as weight, height, strength
- 17/06 • for inflating-pumps
- 17/08 • for seats or footstools
- 17/10 • for means for safe-keeping of property, left temporarily, e.g. by fastening the property
- 17/12 • • comprising lockable containers, e.g. for accepting clothes to be cleaned
- 17/14 • for fastenings for doors (of containers for safe-keeping G07F 17/12); for turnstiles
- 17/16 • for devices exhibiting advertisements, announcements, pictures, or the like
- 17/18 • for washing or drying persons
- 17/20 • for washing or drying articles, e.g. clothes, motor cars
- 17/22 • for cleaning and polishing boots or shoes
- 17/24 • for parking meters
- 17/26 • for printing, stamping, franking, typing, or teleprinting apparatus (ticket printing or like apparatus G07F 17/42)
- 17/28 • for radio apparatus
- 17/30 • for musical instruments
- 17/32 • for games, toys, sports, or amusements
- 17/34 • • depending on the stopping of moving members, e.g. "fruit" machines
- 17/36 • • Age, character, or fortune telling apparatus
- 17/38 • • Ball games; Shooting apparatus
- 17/40 • for devices for accepting orders, advertisements, or the like
- 17/42 • for ticket printing or like apparatus
- 19/00 Complete banking systems; Coded card-free arrangements adapted for dispensing or receiving monies or the like and posting such transactions to existing accounts, e.g. automatic teller machines** (data processing equipment for bank accounting G06Q 40/02) [5]

## **G07G REGISTERING THE RECEIPT OF CASH, VALUABLES, OR TOKENS** (digital computing in general G06C, G06F) [4]

- 1/00 Cash registers** (alarm indicators G07G 3/00)
- 1/01 • Details for indicating (displaying information in general G09F, G09G) [4]
- 1/06 • • with provision for the noting of the money to be paid [4]
- 1/08 • • with rotating drums which display the money entered [4]
- 1/10 • mechanically operated [4]
- 1/12 • electronically operated (digital data processing aspects G06Q 20/00) [4]
- 1/14 • • Systems including one or more distant stations co-operating with a central processing unit (data transmission in general H04L; telemetry systems for selectively calling a substation from a main station H04Q 9/00) [4]
- 3/00 Alarm indicators, e.g. bells**
- 5/00 Receipt-giving machines** (cash registers giving receipts G07G 1/00)

## **G08 SIGNALLING**

### **G08B SIGNALLING OR CALLING SYSTEMS; ORDER TELEGRAPHS; ALARM SYSTEMS**

#### **Note(s)**

1. This subclass covers also means for identifying or incapacitating burglars or the like.
2. This subclass does not cover:
  - the mere provision of an audible or visible signalling device on measuring or switching apparatus;
  - alarm systems for indicating that a specific variable has exceeded, or fallen below, a predetermined value, which are covered by the relevant subclasses of class G01 for the measurement of that variable.
  - alarms for specific processes or types of machines or apparatus, which are covered by the relevant subclasses for the processes, machines, or apparatus.
3. In this subclass, the following term is used with the meaning indicated:
  - "systems" may cover also devices peculiar thereto.

Subclass index

## SIGNALLING OR CALLING SYSTEMS

- Characterised by the transmission of the signal.....1/00  
 Characterised by the nature of the indication: audible; visible; tactile; combined.....3/00, 5/00, 6/00, 7/00

## ORDER TELEGRAPHS.....9/00

## ALARM SYSTEMS

- Responsive to an unspecified condition.....23/00  
 Responsive to two or more different conditions.....19/00  
 Responsive to one specified condition: intrusion; fire; other.....13/00, 15/00, 17/00, 21/00  
 With transmission from or to a central station.....25/00, 26/00, 27/00  
 Predictive alarm systems.....31/00

## CHECKING, MONITORING.....29/00

**1/00 Systems for signalling characterised solely by the form of transmission of the signal**

- 1/02 • using only mechanical transmission  
 1/04 • using hydraulic transmission; using pneumatic transmission  
 1/06 • • hydraulic only  
 1/08 • using electric transmission

**3/00 Audible signalling systems; Audible personal calling systems**

- 3/02 • using only mechanical transmission  
 3/06 • using hydraulic transmission; using pneumatic transmission  
 3/10 • using electric transmission; using electromagnetic transmission  
 3/14 • using explosives

**5/00 Visible signalling systems, e.g. personal calling systems, remote indication of seats occupied**

- 5/02 • using only mechanical transmission  
 5/06 • using hydraulic transmission; using pneumatic transmission  
 5/14 • • with indicator element moving about a pivot, e.g. hinged flap or rotating vane  
 5/16 • • • with reset means necessitating a separate operation to return the indicator element  
 5/18 • • with indicator element moving rectilinearly  
 5/20 • • • with reset means necessitating a separate operation to return the indicator element  
 5/22 • using electric transmission; using electromagnetic transmission  
 5/24 • • with indicator element moving about a pivot, e.g. hinged flap or rotating vane  
 5/26 • • • with reset means necessitating a separate operation to return the indicator element  
 5/28 • • • with hinged flap or arm  
 5/30 • • • with rotating or oscillating members, e.g. vanes  
 5/32 • • with indicator element moving rectilinearly  
 5/34 • • • with reset means necessitating a separate operation to return the indicator element  
 5/36 • • using visible light sources  
 5/38 • • • using flashing light  
 5/40 • using smoke, fire or coloured gases

**6/00 Tactile signalling systems, e.g. personal calling systems [6]****7/00 Signalling systems according to more than one of groups G08B 3/00-G08B 6/00; Personal calling systems according to more than one of groups G08B 3/00-G08B 6/00**

- 7/02 • using mechanical transmission

- 7/04 • using hydraulic transmission; using pneumatic transmission

- 7/06 • using electric transmission

- 7/08 • using explosives

**9/00 Order telegraph apparatus, i.e. means for transmitting one of a finite number of different orders at the discretion of the user, e.g. bridge to engine room orders in ships**

- 9/02 • Details  
 9/04 • • Means for recording operation of the apparatus  
 9/06 • • Means for indicating disagreement between orders given and those carried out  
 9/08 • mechanical  
 9/10 • • using ratchet  
 9/12 • • using rotary shaft  
 9/14 • hydraulic; pneumatic  
 9/16 • • using ratchet  
 9/18 • • by varying displacement of the fluid  
 9/20 • • by varying pressure of the fluid

**13/00 Burglar, theft or intruder alarms**

- 13/02 • Mechanical actuation  
 13/04 • • by breaking of glass  
 13/06 • • by tampering with fastening  
 13/08 • • by opening, e.g. of door, of window, of drawer, of shutter, of curtain, of blind  
 13/10 • • by pressure on floors, floor coverings, stair treads, counters, or tills  
 13/12 • • by the breaking or disturbance of stretched cords or wires  
 13/14 • • by lifting or attempted removal of hand-portable articles  
 13/16 • Actuation by interference with mechanical vibrations in air or other fluid  
 13/18 • Actuation by interference with heat, light, or radiation of shorter wavelength; Actuation by intruding sources of heat, light, or radiation of shorter wavelength  
 13/181 • • using active radiation detection systems [5]  
 13/183 • • • by interruption of a radiation beam or barrier [5]  
 13/184 • • • • using radiation reflectors [5]  
 13/186 • • • • using light guides, e.g. optical fibres [5]  
 13/187 • • • by interference of a radiation field [5]  
 13/189 • • using passive radiation detection systems [5]  
 13/19 • • • using infra-red-radiation detection systems [5]  
 13/191 • • • • using pyroelectric sensor means [5]  
 13/193 • • • • using focusing means [5]  
 13/194 • • • using image scanning and comparing systems [5]

13/196	• • • • using television cameras [5]	21/22	• • responsive to presence or absence of persons [7]
13/20	• Actuation by change of fluid pressure	21/24	• • Reminder alarms, e.g. anti-loss alarms [7]
13/22	• Electrical actuation		
13/24	• • by interference with electromagnetic field distribution	<b>23/00</b>	<b>Alarms responsive to unspecified undesired or abnormal conditions</b>
13/26	• • by proximity of an intruder causing variation in capacitance or inductance of a circuit		
<b>15/00</b>	<b>Identifying, scaring or incapacitating burglars, thieves or intruders, e.g. by explosives</b>	<b>25/00</b>	<b>Alarm systems in which the location of the alarm condition is signalled to a central station, e.g. fire or police telegraphic systems</b>
15/02	• with smoke, gas, or coloured or odorous powder or liquid	25/01	• characterised by the transmission medium [5]
		25/04	• • using a single signalling line, e.g. in a closed loop [5]
<b>17/00</b>	<b>Fire alarms; Alarms responsive to explosion</b>	25/06	• • using power transmission lines [5]
17/02	• Mechanical actuation of the alarm, e.g. by the breaking of a wire	25/08	• • using communication transmission lines [5]
17/04	• Hydraulic or pneumatic actuation of the alarm, e.g. by change of fluid pressure	25/10	• • using wireless transmission systems [5]
17/06	• Electric actuation of the alarm, e.g. using a thermally-operated switch	25/12	• Manually actuated calamity alarm transmitting arrangements [5]
17/08	• Actuation involving the use of explosive means	25/14	• Central alarm receiver or annunciator arrangements [5]
17/10	• Actuation by presence of smoke or gases	<b>26/00</b>	<b>Alarm systems in which substations are interrogated in succession by a central station</b>
17/103	• • using a light emitting and receiving device [5]		
17/107	• • • for detecting light-scattering due to smoke [5]	<b>27/00</b>	<b>Alarm systems in which the alarm condition is signalled from a central station to a plurality of substations</b>
17/11	• • using an ionisation chamber for detecting smoke or gas [5]		
17/113	• • • Constructional details [5]	<b>29/00</b>	<b>Checking or monitoring of signalling or alarm systems; Prevention or correction of operating errors, e.g. preventing unauthorised operation</b>
17/117	• • by using a detection device for specific gases, e.g. combustion products, produced by the fire (G08B 17/103, G08B 17/11 take precedence) [5]	29/02	• Monitoring continuously signalling or alarm systems [5]
17/12	• Actuation by presence of radiation or particles, e.g. of infra-red radiation or of ions	29/04	• • Monitoring of the detection circuits [5]
		29/06	• • Monitoring of the line circuits, e.g. signalling of line faults [5]
<b>19/00</b>	<b>Alarms responsive to two or more different undesired or abnormal conditions, e.g. burglary and fire, abnormal temperature and abnormal rate of flow</b>	29/08	• • • Signalling of tampering with the line circuit [5]
19/02	• Alarm responsive to formation or anticipated formation of ice	29/10	• • Monitoring of the annunciator circuits [5]
		29/12	• Checking intermittently signalling or alarm systems [5]
<b>21/00</b>	<b>Alarms responsive to a single specified undesired or abnormal condition and not otherwise provided for</b>	29/14	• • checking the detection circuits [5]
21/02	• Alarms for ensuring the safety of persons [7]	29/16	• Security signalling or alarm systems, e.g. redundant systems [5]
21/04	• • responsive to non-activity, e.g. of elderly persons (G08B 21/06 takes precedence) [7]	29/18	• Prevention or correction of operating errors (G08B 29/02, G08B 29/12 take precedence) [5]
21/06	• • indicating a condition of sleep, e.g. anti-dozing alarms [7]	29/20	• • Calibration, including self-calibrating arrangements [5]
21/08	• • responsive to the presence of persons in a body of water, e.g. a swimming pool; responsive to an abnormal condition of a body of water [7]	29/22	• • • Provisions facilitating manual calibration, e.g. input or output provisions for testing; Holding of intermittent values to permit measurement [5]
21/10	• • responsive to calamitous events, e.g. tornados or earthquakes [7]	29/24	• • • Self-calibration, e.g. compensating for environmental drift or ageing of components [5]
21/12	• • responsive to undesired emission of substances, e.g. pollution alarms [7]	29/26	• • • • by updating and storing reference thresholds [5]
21/14	• • • Toxic gas alarms (G08B 21/16 takes precedence) [7]	29/28	• • • • by changing the gain of an amplifier [5]
21/16	• • • Combustible gas alarms [7]		
21/18	• Status alarms (G08B 21/02 takes precedence) [7]	<b>31/00</b>	<b>Predictive alarm systems characterised by extrapolation or other computation using updated historic data [5]</b>
21/20	• • responsive to moisture [7]		

**G08C TRANSMISSION SYSTEMS FOR MEASURED VALUES, CONTROL OR SIMILAR SIGNALS** (fluid pressure transmission systems F15B; mechanical means for transferring the output of a sensing member into a different variable G01D 5/00; mechanical control systems G05G) [4]

### Subclass index

#### TRANSMISSION SYSTEMS IN GENERAL

Electric; non-electric..... 19/00, 23/00

SYSTEMS FOR TRANSMITTING THE POSITION OF AN OBJECT..... 21/00

#### ARRANGEMENTS CHARACTERISED BY THE METHOD OF TRANSMISSION

Multiplex; use of a wireless electrical link..... 15/00, 17/00

#### PROCESSING SIGNALS

Differentiating, delaying..... 13/00

MONITORING, PREVENTING OR CORRECTING ERRORS..... 25/00

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|-------|--|-------|--|
| 13/00 | <b>Arrangements for influencing the relationship between signals at input and output, e.g. differentiating, delaying</b>       | 19/20 | • • • operating on dynamo-electric devices, e.g. step motor  |
| 13/02 | • to yield a signal which is a function of two or more signals, e.g. sum, product  | 19/22 | • • by varying the duration of individual pulses   |
| 15/00 | <b>Arrangements characterised by the use of multiplexing for the transmission of a plurality of signals over a common path</b> | 19/24 | • • using time shift of pulses   |
| 15/02 | • simultaneously, i.e. using frequency division  | 19/26 | • • by varying pulse repetition frequency  |
| 15/04 | • • the signals being modulated on carrier frequencies   | 19/28 | • • using pulse code   |
| 15/06 | • successively, i.e. using time division   | 19/30 | • in which transmission is by selection of one or more conductors or channels from a plurality of conductors or channels (G08C 19/38 takes precedence) |
| 15/08 | • • the signals being represented by amplitude of current or voltage in transmission link                                      | 19/32 | • • of one conductor or channel  |
| 15/10 | • • the signals being represented by frequencies or phase of current or voltage in transmission link                           | 19/34 | • • of a combination of conductors or channels   |
| 15/12 | • • the signals being represented by pulse characteristics in transmission link  | 19/36 | • using optical means to convert the input signal  |
| 17/00 | <b>Arrangements for transmitting signals characterised by the use of a wireless electrical link [6]</b>                        | 19/38 | • using dynamo-electric devices (operated by pulses G08C 19/20)  |
| 17/02 | • using a radio link [6]   | 19/40 | • • of which only the rotor or the stator carries a winding to which a signal is applied, e.g. using step motor  |
| 17/04 | • using magnetically coupled devices [6]   | 19/42 | • • • having three stator poles  |
| 17/06 | • using capacity coupling [6]  | 19/44 | • • • having more than three stator poles  |
| 19/00 | <b>Electric signal transmission systems</b> (G08C 17/00 takes precedence)  | 19/46 | • • of which both rotor and stator carry windings (having squirrel-cage rotor G08C 19/40)  |
| 19/02 | • in which the signal transmitted is magnitude of current or voltage (G08C 19/36, G08C 19/38 take precedence)                  | 19/48 | • • • being of the type with a three-phase stator and a rotor fed by constant-frequency ac, e.g. selsyn, magflip                                       |
| 19/04 | • • using variable resistance  | 21/00 | <b>Systems for transmitting the position of an object with respect to a predetermined reference system, e.g. tele-autographic system [5]</b>           |
| 19/06 | • • using variable inductance  | 23/00 | <b>Non-electric signal transmission systems, e.g. optical systems</b>  |
| 19/08 | • • • differentially influencing two coils   | 23/02 | • using acoustic waves [6]   |
| 19/10 | • • using variable capacitance   | 23/04 | • using light waves, e.g. infra-red [6]  |
| 19/12 | • in which the signal transmitted is frequency or phase of ac  | 23/06 | • • through light guides, e.g. optical fibres [6]  |
| 19/14 | • • using combination of fixed frequencies   | 25/00 | <b>Arrangements for preventing or correcting errors; Monitoring arrangements</b>   |
| 19/16 | • in which transmission is by pulses   | 25/02 | • by signalling back from receiving station to transmitting station  |
| 19/18 | • • using a variable number of pulses in a train   | 25/04 | • by recording transmitted signals   |

**G08G** **TRAFFIC CONTROL SYSTEMS** (guiding railway traffic, ensuring the safety of railway traffic B61L; radar or analogous systems, sonar systems or lidar systems specially adapted for traffic control G01S 13/91, G01S 15/88, G01S 17/88; radar or analogous systems, sonar systems or lidar systems specially adapted for anti-collision purposes G01S 13/93, G01S 15/93, G01S 17/93; control of position, course, altitude or attitude of land, water, air or space vehicles, not being specific to a traffic environment G05D 1/00) [2]

### Note(s)

This subclass covers:

- identification of traffic offenders;
  - indicating the position of vehicles for traffic control purposes;
  - navigation systems for traffic control purposes, i.e. systems in which the navigation is not performed autonomously by or in the vehicles, but where the vehicles are guided by instructions transmitted to them;
  - indication of free spaces in parking areas.
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|---|--|
| <p><b>1/00</b> <b>Traffic control systems for road vehicles</b> (arrangement of road signs or traffic signals E01F 9/00)</p> <p>1/005 • including pedestrian guidance indicator [5]</p> <p>1/01 • Detecting movement of traffic to be counted or controlled (G08G 1/07-G08G 1/14 take precedence; road pricing or congestion charging of vehicles or vehicle users G07B 15/06)</p> <p>1/015 • • with provision for distinguishing between motor cars and cycles</p> <p>1/017 • • identifying vehicles (G08G 1/015, G08G 1/054 take precedence) [5]</p> <p>1/02 • • using treadles built into the road</p> <p>1/04 • • using optical or ultrasonic detectors</p> <p>1/042 • • using inductive or magnetic detectors [5]</p> <p>1/048 • • with provision for compensation of environmental or other condition, e.g. snow, vehicle stopped at detector [5]</p> <p>1/052 • • with provision for determining speed or overspeed [5]</p> <p>1/054 • • • photographing overspeeding vehicles [5]</p> <p>1/056 • • with provision for distinguishing direction of travel [5]</p> <p>1/065 • by counting the vehicles in a section of the road or in a parking area, i.e. comparing incoming count with outgoing count (road pricing or congestion charging of vehicles or vehicle users G07B 15/06)</p> <p>1/07 • Controlling traffic signals</p> <p>1/08 • • according to detected number or speed of vehicles</p> <p>1/081 • • Plural intersections under common control [5]</p> <p>1/082 • • • Controlling the time between beginning of the same phase of a cycle at adjacent intersections [5]</p> <p>1/083 • • • Controlling the allocation of time between phases of a cycle [5]</p> <p>1/085 • • using a free-running cyclic timer</p> <p>1/087 • • Override of traffic control, e.g. by signal transmitted by an emergency vehicle [5]</p> <p>1/09 • Arrangements for giving variable traffic instructions</p> <p>1/095 • • Traffic lights</p> <p>1/0955 • • • transportable [5]</p> <p>1/096 • • provided with indicators in which a mark progresses showing the time elapsed, e.g. of green phase</p> <p>1/0962 • • having an indicator mounted inside the vehicle, e.g. giving voice messages [5]</p> | <p>1/0965 • • • responding to signals from another vehicle, e.g. emergency vehicle [5]</p> <p>1/0967 • • • Systems involving transmission of highway information, e.g. weather, speed limits (G08G 1/0968 takes precedence) [5]</p> <p>1/0968 • • • Systems involving transmission of navigation instructions to the vehicle [5]</p> <p>1/0969 • • • having a display in the form of a map [5]</p> <p>1/097 • Supervising of traffic control systems, e.g. by giving an alarm if two crossing streets have green light simultaneously</p> <p>1/123 • indicating the position of vehicles, e.g. scheduled vehicles [5]</p> <p>1/127 • • to a central station [5]</p> <p>1/13 • • • the indicator being in the form of a map [5]</p> <p>1/133 • • within the vehicle [5]</p> <p>1/137 • • • the indicator being in the form of a map [5]</p> <p>1/14 • indicating individual free spaces in parking areas</p> <p>1/16 • Anti-collision systems [2, 2006.01]</p> <p><b>3/00</b> <b>Traffic control systems for marine craft</b> (marking of navigational route B63B 51/00)</p> <p>3/02 • Anti-collision systems</p> <p><b>5/00</b> <b>Traffic control systems for aircraft</b> [2]</p> <p>5/02 • Automatic landing aids, i.e. systems in which flight data of incoming planes are processed to provide landing data (landing aids fitted in or to aircraft, or safety measures fitted in or to aircraft to prevent collision with earth's surface B64D 45/04; visual or acoustic landing aids on the ground or on aircraft-carrier decks B64F 1/18)</p> <p>5/04 • Anti-collision systems</p> <p>5/06 • for control when on the ground [2]</p> <p><b>7/00</b> <b>Traffic control systems for simultaneous control of two or more different kinds of craft</b> [2]</p> <p>7/02 • Anti-collision systems [2]</p> <p><b>9/00</b> <b>Traffic control systems for craft where the kind of craft is irrelevant or unspecified</b> [2]</p> <p>9/02 • Anti-collision systems [2]</p> <p><b>99/00</b> <b>Subject matter not provided for in other groups of this subclass</b> [2006.01]</p> |
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**G09 EDUCATING; CRYPTOGRAPHY; DISPLAY; ADVERTISING; SEALS****G09B EDUCATIONAL OR DEMONSTRATION APPLIANCES; APPLIANCES FOR TEACHING, OR COMMUNICATING WITH, THE BLIND, DEAF OR MUTE; MODELS; PLANETARIA; GLOBES; MAPS; DIAGRAMS****Note(s)**

1. This subclass covers :
  - simulators regarded as teaching or training devices, which is the case if they give perceptible sensations having a likeness to the sensations a student would experience in reality in response to actions taken by him;
  - models of buildings, installations, or the like.
2. This subclass does not cover :
  - simulators which merely demonstrate or illustrate the function of an apparatus or of a system by means involving computing, and therefore cannot be regarded as teaching or training devices. Such simulators are covered by class G06, if no provision exists elsewhere;
  - components of simulators, if identical with real devices or machines, which are covered by the relevant subclasses for these devices or machines and not by class G09.

**Subclass index****TEACHING EQUIPMENT IN GENERAL**

## General principle of operation

manual or mechanical.....	1/00, 3/00
electrical.....	5/00, 7/00
operating by question and answer.....	3/00, 7/00
Simulators.....	9/00

**TEACHING EQUIPMENT FOR SPECIFIC PURPOSES**

For writing, shorthand, drawing, painting; for typing.....	11/00, 13/00
For music; for reading.....	15/00, 17/00
Models for scientific or technical training.....	23/00, 25/00
Planetaria, globes; maps, diagrams.....	27/00, 29/00
Other teaching equipment.....	19/00

**TEACHING, AND COMMUNICATING WITH, THE BLIND OR DEAF.....21/00**

- 1/00 Manually- or mechanically-operated educational appliances using elements forming or bearing symbols, signs, pictures, or the like which are arranged or adapted to be arranged in one or more particular ways**
- 1/02 • and having a support carrying or adapted to carry the elements
- 1/04 • • the elements each bearing a single symbol or a single combination of symbols
- 1/06 • • • and being attachable to, or mounted on, the support
- 1/08 • • • • by means of magnets
- 1/10 • • • • by means of pins and holes
- 1/12 • • • • by means of ring-like securing elements
- 1/14 • • • • the elements being slidably mounted on the support
- 1/16 • • the elements each bearing a plurality of different symbols, signs, or combinations of symbols and signs, only one symbol, sign, or combination thereof, of each element to be used at a time
- 1/18 • • • the elements being rotatable
- 1/20 • • • • and bearing the symbols on a surface parallel to the axis of rotation
- 1/22 • • • • and bearing the symbols on a surface perpendicular to the axis of rotation
- 1/24 • • • the elements being in flexible-strip form, e.g. endless bands
- 1/26 • • • the elements being arranged in fan form
- 1/28 • • • the elements being slidable

- 1/30 • • wherein the elements are adapted to be arranged in co-operation with the support to form symbols
- 1/32 • comprising elements to be used without a special support
- 1/34 • • the elements to be placed loosely in adjacent relationship
- 1/36 • • the elements being connectible by corresponding projections and recesses
- 1/38 • • the elements being connectible magnetically
- 1/40 • • to form symbols or signs by appropriate arrangement

**3/00 Manually- or mechanically-operated teaching appliances working with questions and answers**

- 3/02 • of the type wherein the student is expected to construct an answer to the question which is presented or wherein the machine gives an answer to the question presented by the student
- 3/04 • • of chart form
- 3/06 • of the multiple-choice answer type, i.e. where a given question is provided with a series of answers and a choice has to be made
- 3/08 • • of chart form
- 3/10 • • wherein one set of answers is common to a plurality of questions
- 3/12 • • • of chart form

**5/00 Electrically-operated educational appliances [2]**

**Note(s)**

Group G09B 5/08 takes precedence over groups G09B 5/02-G09B 5/06.

- 5/02 • with visual presentation of the material to be studied, e.g. using film strip
- 5/04 • with audible presentation of the material to be studied
- 5/06 • with both visual and audible presentation of the material to be studied
- 5/08 • providing for individual presentation of information to a plurality of student stations [2]
- 5/10 • • all student stations being capable of presenting the same information simultaneously (G09B 5/14 takes precedence) [2]
- 5/12 • • different stations being capable of presenting different information simultaneously (G09B 5/14 takes precedence) [2]
- 5/14 • • with provision for individual teacher-student communication [2]

**7/00 Electrically-operated teaching apparatus or devices working with questions and answers**

- 7/02 • of the type wherein the student is expected to construct an answer to the question which is presented or wherein the machine gives an answer to the question presented by the student
- 7/04 • • characterised by modifying the teaching programme in response to a wrong answer, e.g. repeating the question, supplying a further explanation
- 7/06 • of the multiple-choice answer type, i.e. where a given question is provided with a series of answers and a choice has to be made from the answers
- 7/07 • • providing for individual presentation of questions to a plurality of student stations [2]
- 7/073 • • • all student stations being capable of presenting the same questions simultaneously [2]
- 7/077 • • • different stations being capable of presenting different questions simultaneously [2]
- 7/08 • • characterised by modifying the teaching programme in response to a wrong answer, e.g. repeating the question, supplying further information
- 7/10 • • wherein a set of answers is common to a plurality of questions
- 7/12 • • • characterised by modifying the teaching programme in response to a wrong answer, e.g. repeating the question, supplying further information

**9/00 Simulators for teaching or training purposes**

- 9/02 • for teaching control of vehicles or other craft
- 9/04 • • for teaching control of land vehicles
- 9/042 • • • providing simulation in a real vehicle (G09B 9/052, G09B 9/058 take precedence) [5]
- 9/048 • • • a model being viewed and manoeuvred from a remote point (G09B 9/052, G09B 9/058 take precedence) [5]
- 9/05 • • • the view from a vehicle being simulated (G09B 9/052, G09B 9/058 take precedence) [5]
- 9/052 • • • characterised by provision for recording or measuring trainee's performance [5]
- 9/058 • • • for teaching control of cycles or motorcycles [5]
- 9/06 • • for teaching control of ships, boats, or other waterborne vehicles [2]
- 9/08 • • for teaching control of aircraft, e.g. Link trainer

- 9/10 • • • with simulated flight- or engine-generated force being applied to aircraft occupant (G09B 9/28 takes precedence) [5]
- 9/12 • • • Motion systems for aircraft simulators [5]
- 9/14 • • • • controlled by fluid actuated piston or cylinder ram [5]
- 9/16 • • • Ambient or aircraft conditions simulated or indicated by instrument or alarm [5]
- 9/18 • • • • Condition of engine or fuel supply [5]
- 9/20 • • • • Simulation or indication of aircraft attitude [5]
- 9/22 • • • including aircraft sound simulation [5]
- 9/24 • • • including display or recording of simulated flight path [5]
- 9/26 • • • Simulation of radio-navigation [5]
- 9/28 • • • Simulation of stick forces or the like [5]
- 9/30 • • • Simulation of view from aircraft [5]
- 9/32 • • • • by projected image (G09B 9/36 takes precedence) [5]
- 9/34 • • • • by cathode-ray screen display (G09B 9/36 takes precedence) [5]
- 9/36 • • • • Simulation of night or reduced visibility flight [5]
- 9/38 • • • • • Simulation of runway outlining or approach lights [5]
- 9/40 • • • Simulation of airborne radar [5]
- 9/42 • • • Aircraft, aircraft simulator, or means connected thereto, travelling on the ground or water during simulated flight training [5]
- 9/44 • • • providing simulation in a real aircraft flying through the atmosphere without restriction of its path [5]
- 9/46 • • • the aircraft being a helicopter [5]

**Note(s)**

When classifying in group G09B 9/46, classification is also made in other appropriate subgroups of group G09B 9/08, if of interest.

- 9/48 • • • a model being viewed and manoeuvred from a remote point [5]
- 9/50 • • • Automatically directing the course of the aircraft [5]
- 9/52 • • for teaching control of an outer space vehicle [5]
- 9/54 • Simulation of radar (G09B 9/40 takes precedence) [5]
- 9/56 • Simulation of sonar [5]

**11/00 Teaching hand-writing, shorthand, drawing, or painting**

- 11/02 • Finger, hand, or arm supporting devices
- 11/04 • Guide sheets or plates; Tracing charts
- 11/06 • Devices involving the use of transparent or translucent tracing material, e.g. copy books
- 11/08 • Teaching shorthand
- 11/10 • Teaching painting

**13/00 Teaching typing**

- 13/02 • Dummy practice keyboard apparatus
- 13/04 • Devices used in association with a real typewriter, teleprinter, or the like

**15/00 Teaching music**

- 15/02 • Boards or like means for providing an indication of notes
- 15/04 • • with sound-emitters
- 15/06 • Devices for exercising or strengthening fingers or arms; Devices for holding fingers or arms in a proper position for playing

## G09B

15/08	<ul style="list-style-type: none"><li>Practice keyboards</li></ul>	23/14	<ul style="list-style-type: none"><li>• • for acoustics</li></ul>
<b>17/00</b>	<b>Teaching reading</b>	23/16	<ul style="list-style-type: none"><li>• • for science of heat</li></ul>
17/02	<ul style="list-style-type: none"><li>Line indicators or other guides or masks</li></ul>	23/18	<ul style="list-style-type: none"><li>• • for electricity or magnetism</li></ul>
17/04	<ul style="list-style-type: none"><li>for increasing the rate of reading; Reading rate control</li></ul>	23/20	<ul style="list-style-type: none"><li>• • for atomic physics or nucleonics</li></ul>
<b>19/00</b>	<b>Teaching not covered by other main groups of this subclass</b> (teaching or practice apparatus for gun-aiming or gun-laying F41G 3/26)	23/22	<ul style="list-style-type: none"><li>• • for optics</li></ul>
19/02	<ul style="list-style-type: none"><li>Counting; Calculating</li></ul>	23/24	<ul style="list-style-type: none"><li>for chemistry</li></ul>
19/04	<ul style="list-style-type: none"><li>Speaking (with audible presentation of the material to be studied G09B 5/04)</li></ul>	23/26	<ul style="list-style-type: none"><li>for molecular structures; for crystallography</li></ul>
19/06	<ul style="list-style-type: none"><li>Foreign languages (with audible presentation of the material to be studied G09B 5/04)</li></ul>	23/28	<ul style="list-style-type: none"><li>for medicine</li></ul>
19/08	<ul style="list-style-type: none"><li>• • Printed or written appliances, e.g. textbooks, bilingual letter assemblies, charts</li></ul>	23/30	<ul style="list-style-type: none"><li>• • Anatomical models (dental articulators A61C 11/00)</li></ul>
19/10	<ul style="list-style-type: none"><li>Modelling</li></ul>	23/32	<ul style="list-style-type: none"><li>• • • with moving parts</li></ul>
19/12	<ul style="list-style-type: none"><li>Clock-reading</li></ul>	23/34	<ul style="list-style-type: none"><li>• • • with removable parts</li></ul>
19/14	<ul style="list-style-type: none"><li>Traffic procedures, e.g. traffic regulations</li></ul>	23/36	<ul style="list-style-type: none"><li>for zoology</li></ul>
19/16	<ul style="list-style-type: none"><li>Control of vehicles or other craft</li></ul>	23/38	<ul style="list-style-type: none"><li>for botany</li></ul>
19/18	<ul style="list-style-type: none"><li>Book-keeping or economics</li></ul>	23/40	<ul style="list-style-type: none"><li>for geology</li></ul>
19/20	<ul style="list-style-type: none"><li>Needlework</li></ul>	<b>25/00</b>	<b>Models for purposes not provided for in group G09B 23/00, e.g. full-sized devices for demonstration purposes</b> (model vehicles, tracks therefor, models in the nature of toys A63H)
19/22	<ul style="list-style-type: none"><li>Games, e.g. card games</li></ul>	25/02	<ul style="list-style-type: none"><li>of industrial processes; of machinery</li></ul>
19/24	<ul style="list-style-type: none"><li>Use of tools</li></ul>	25/04	<ul style="list-style-type: none"><li>of buildings</li></ul>
19/26	<ul style="list-style-type: none"><li>Dot-and-dash telegraph codes [2]</li></ul>	25/06	<ul style="list-style-type: none"><li>for surveying; for geography, e.g. relief models (globes G09B 27/00; maps G09B 29/00)</li></ul>
<b>21/00</b>	<b>Teaching, or communicating with, the blind, deaf or mute</b> (audible presentation of material to be studied G09B 5/04) [2, 4]	25/08	<ul style="list-style-type: none"><li>of scenic effects, e.g. trees, rocks, water surfaces (for stage purposes A63J 1/00)</li></ul>
21/02	<ul style="list-style-type: none"><li>Devices for Braille writing</li></ul>	<b>27/00</b>	<b>Planetaria; Globes</b>
21/04	<ul style="list-style-type: none"><li>Devices for conversing with the deaf-blind</li></ul>	27/02	<ul style="list-style-type: none"><li>Tellurions; Orreries</li></ul>
21/06	<ul style="list-style-type: none"><li>Devices for teaching lip-reading</li></ul>	27/04	<ul style="list-style-type: none"><li>Celestial maps</li></ul>
<b>23/00</b>	<b>Models for scientific, medical, or mathematical purposes, e.g. full-sized device for demonstration purposes</b> (in the nature of toys A63H)	27/06	<ul style="list-style-type: none"><li>Celestial globes</li></ul>
23/02	<ul style="list-style-type: none"><li>for mathematics</li></ul>	27/08	<ul style="list-style-type: none"><li>Globes (celestial globes G09B 27/06)</li></ul>
23/04	<ul style="list-style-type: none"><li>• • for geometry, trigonometry, projection, or perspective (for surveying G09B 25/06)</li></ul>	<b>29/00</b>	<b>Maps</b> (celestial maps G09B 27/04); <b>Plans; Charts; Diagrams, e.g. route diagrams</b>
23/06	<ul style="list-style-type: none"><li>for physics</li></ul>	29/02	<ul style="list-style-type: none"><li>sectional</li></ul>
23/08	<ul style="list-style-type: none"><li>• • for statics or dynamics</li></ul>	29/04	<ul style="list-style-type: none"><li>• • the sections being arranged in the form of a foldable sheet or sheets</li></ul>
23/10	<ul style="list-style-type: none"><li>• • • of solid bodies</li></ul>	29/06	<ul style="list-style-type: none"><li>of belt form, e.g. endless belt</li></ul>
23/12	<ul style="list-style-type: none"><li>• • • of liquids or gases</li></ul>	29/08	<ul style="list-style-type: none"><li>Hanging maps or the like</li></ul>
		29/10	<ul style="list-style-type: none"><li>Map spot or co-ordinate position indicators; Map-reading aids</li></ul>
		29/12	<ul style="list-style-type: none"><li>Relief maps</li></ul>
		29/14	<ul style="list-style-type: none"><li>Local-time charts</li></ul>

## G09C CIPHERING OR DECIPHERING APPARATUS FOR CRYPTOGRAPHIC OR OTHER PURPOSES INVOLVING THE NEED FOR SECRECY

<b>1/00</b>	<b>Apparatus or methods whereby a given sequence of signs, e.g. an intelligible text, is transformed into an unintelligible sequence of signs by transposing the signs or groups of signs or by replacing them by others according to a predetermined system</b> (cryptographic typewriters G09C 3/00)	1/08	<ul style="list-style-type: none"><li>• • the connections being mechanical</li></ul>
1/02	<ul style="list-style-type: none"><li>by using a ciphering code in chart form</li></ul>	1/10	<ul style="list-style-type: none"><li>• • the connections being electrical</li></ul>
1/04	<ul style="list-style-type: none"><li>with sign carriers or indicators moved relative to one another to positions determined by a permutation code or key, so as to indicate the appropriate corresponding clear or ciphered text</li></ul>	1/12	<ul style="list-style-type: none"><li>• • • comprising contact-bearing permutation discs</li></ul>
1/06	<ul style="list-style-type: none"><li>wherein elements corresponding to the signs making up the clear text are operatively connected with elements corresponding to the signs making up the ciphered text, the connections, during operation of the apparatus, being automatically and continuously permuted by a coding or key member</li></ul>	1/14	<ul style="list-style-type: none"><li>• • involving removable or interchangeable coding numbers, e.g. master tapes, punched cards</li></ul>
		<b>3/00</b>	<b>Typewriters for ciphering or deciphering cryptographic text</b>
		3/02	<ul style="list-style-type: none"><li>with auxiliary keys or keyboards acting on the original keys or keyboards</li></ul>
		3/04	<ul style="list-style-type: none"><li>wherein the operative connections between the keys and the type-bars are automatically and continuously permuted, during operation, by a coding or key member</li></ul>
		3/06	<ul style="list-style-type: none"><li>• • the connections being mechanical</li></ul>
		3/08	<ul style="list-style-type: none"><li>• • the connections being electrical</li></ul>

- 3/10 • • involving removable or interchangeable coding members, e.g. master tapes, punched cards

**5/00 Cipherring or deciphering apparatus or methods not provided for in other groups of this subclass, e.g. involving the concealment or deformation of graphic data such as designs, written or printed messages**

## G09D RAILWAY OR LIKE TIME OR FARE TABLES; PERPETUAL CALENDARS

**1/00 Railway or like time or fare tables; Indicating or reading aids therefor** (incorporating maps or route diagrams, e.g. railway routing charts G09B 29/00)

**3/00 Perpetual calendars** (printed calendar blocks B42D 5/04; clockwork-driven perpetual calendars G04B 19/24)

- 3/02 • with interchangeable members bearing the indicia  
 3/04 • wherein members bearing the indicia are movably mounted in the calendar  
 3/06 • • with rotatable members  
 3/08 • • • of disc form  
 3/10 • • with members in band form  
 3/12 • electrically operated

## G09F DISPLAYING; ADVERTISING; SIGNS; LABELS OR NAME-PLATES; SEALS

### Note(s)

- In this subclass, the following term is used with the meaning indicated:
  - "sign" designates a mark or indication serving to make something recognisable, the information presented being non-varying, even if it is flashing; by way of example it covers, therefore, advertising hoardings, or luminous, or light reflecting, safety arrangements.
- Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "micro-structural devices" and "micro-structural systems".

### Subclass index

#### INFORMATION AND ADVERTISING

Displaying samples.....5/00

With fixed information:

show-cards; labels or tags; signs, plates, characters.....1/00, 3/00, 7/00

With variable information:

by combination of elements; by movement of complete information.....9/00, 11/00

Illuminated signs; luminous advertising.....13/00

Supports used for bill-posting and advertising: panels; banners; goods; others.....15/00, 17/00, 23/00, 19/00

#### PROCESSES OF ADVERTISING

Movable; audible; audio-visual; others.....21/00, 25/00, 27/00, 19/00

**1/00 Cardboard or like show-cards of foldable or flexible material**

1/02 • Single substantially-flat cards

1/04 • Folded cards

1/06 • • to be erected in three dimensions (G09F 1/08 takes precedence)

1/08 • wholly or partly imitating the form of an object, e.g. of the article to be advertised

1/10 • Supports or holders for show-cards

1/12 • • Frames therefor

1/14 • • in the form of legs

**3/00 Labels, tag tickets, or similar identification or indication means; Seals; Postage or like stamps**

3/02 • Forms or constructions

3/03 • • of security seals

3/04 • to be fastened or secured by the material of the label itself, e.g. by thermo-adhesion (by a separate adhesive layer G09F 3/10)

3/06 • • by clamping action (by separate clamps G09F 3/16)

3/08 • Fastening or securing by means not forming part of the material of the label itself

3/10 • • by an adhesive layer

3/12 • • by pins, staples, or the like

3/14 • • by strings, straps, chains, or wires

3/16 • • by clamps

3/18 • • Casings, frames, or enclosures for labels

3/20 • • • for adjustable, removable, or interchangeable labels

**5/00 Means for displaying samples**

5/02 • Portable sample cases

5/04 • Cards of samples; Books of samples

**7/00 Signs, name or number plates, letters, numerals, or symbols; Panels or boards** (show-cards G09F 1/00; indicating arrangements for variable information G09F 9/00, G09F 11/00; illuminated signs G09F 13/00; boards for notices or posters G09F 15/00)

7/02 • Signs, plates, panels, or boards using readily-detachable elements bearing or forming symbols

7/04 • • the elements being secured or adapted to be secured by magnetic means

7/06 • • the elements being secured or adapted to be secured by means of pins and holes

7/08 • • the elements being secured or adapted to be secured by means of grooves, rails, or slits

- 7/10 • • • and slidably mounted
- 7/12 • • the elements being secured or adapted to be secured by self-adhesion, moisture, suction, slow-drying adhesive, or the like
- 7/14 • • Constructional features of the symbol-bearing or -forming elements
- 7/16 • Letters, numerals, or other symbols, adapted for permanent fixing to a support
- 7/18 • Means for attaching signs, plates, panels, or boards to a supporting structure
- 7/20 • • for adjustably mounting
- 7/22 • • for rotatably or swingably mounting, e.g. for boards adapted to be rotated by the wind
  
- 9/00 Indicating arrangements for variable information in which the information is built-up on a support by selection or combination of individual elements** (in which the variable information is permanently attached to a movable support G09F 11/00)
- 9/30 • in which the desired character or characters are formed by combining individual elements
  
- Note(s) [2012.01]**  
Group G09F 9/302 takes precedence over groups G09F 9/305-G09F 9/37.
- 9/302 • • characterised by the form or geometrical disposition of the individual elements [7]
- 9/305 • • being the ends of optical fibres (G09F 9/302 takes precedence) [7]
- 9/307 • • being incandescent filaments [3, 7]
- 9/313 • • being gas discharge devices [3, 7]
- 9/33 • • being semiconductor devices, e.g. diodes [3, 7]
- 9/35 • • being liquid crystals [3, 7]
- 9/37 • • being movable elements [3, 7]
- 9/40 • in which the desired character is selected from a number of characters arranged one beside the other, e.g. on a common carrier plate
- 9/46 • in which the desired character is selected from a number of characters arranged one behind the other
  
- 11/00 Indicating arrangements for variable information in which the complete information is permanently attached to a movable support which brings it to the display position**
- 11/02 • the display elements being secured to rotating members, e.g. drums, spindles
- 11/04 • • the elements being secured to rotating discs
- 11/06 • • the elements being stiff plates or cards (on rotating discs G09F 11/04)
- 11/08 • • the elements being flexible sheets (on rotating discs G09F 11/04)
- 11/10 • • Electric control therefor
- 11/12 • the display elements being carried by endless belts, chains, or the like
- 11/14 • • the elements being in the form of stiff flaps, boards, cards, or the like
- 11/15 • • the elements being flexible sheets
- 11/16 • • Electric control therefor
- 11/18 • the display elements being carried by belts, chains, or the like, other than endless
- 11/20 • • the elements being in the form of stiff flaps, boards, cards, or the like
- 11/21 • • the elements being flexible sheets
- 11/22 • • Electric control therefor
- 11/23 • the advertising or display material forming part of rotating members, e.g. in the form of perforations, prints, or transparencies on a drum or disc
  
- 11/235 • • Electric control therefor
- 11/24 • the advertising or display material forming part of a moving band, e.g. in the form of perforations, prints, or transparencies
- 11/26 • • of an endless band
- 11/28 • • • Electric control therefor
- 11/29 • • of a band other than endless
- 11/295 • • • Electric control therefor
- 11/30 • the display elements being fed one by one from a storage place to a display position
- 11/32 • • the feeding means comprising belts or chains, e.g. endless belts or chains
- 11/34 • • the feeding means comprising electromagnets
  
- 13/00 Illuminated signs; Luminous advertising** (G09F 9/00, G09F 11/00 take precedence; mobile visual advertising G09F 21/00)
- 13/02 • Signs, boards, or panels, illuminated by artificial light sources positioned in front of the insignia
- 13/04 • Signs, boards, or panels, illuminated from behind the insignia
- 13/06 • • using individual cut-out symbols or cut-out silhouettes, e.g. perforated signs
- 13/08 • • using both translucent and non-translucent layers
- 13/10 • • • using transparencies
- 13/12 • • using a transparent mirror or other light-reflecting surface transparent to transmitted light whereby a sign, symbol, picture, or other information is visible only when illuminated
- 13/14 • • Arrangements of reflectors therein
- 13/16 • Signs formed of, or incorporating, reflecting elements or surfaces, e.g. warning signs having triangular or other geometrical shape
- 13/18 • Edge-illuminated signs
- 13/20 • with luminescent surfaces or parts
- 13/22 • • electroluminescent
- 13/24 • using tubes or the like filled with liquid, e.g. bubbling liquid
- 13/26 • Signs formed by electric discharge tubes (by selective lighting G09F 9/00)
- 13/28 • Signs formed by filament-type lamps (by selective lighting G09F 9/00)
- 13/30 • with moving light sources, e.g. rotating luminous tubes
- 13/32 • with moving optical part or parts, e.g. mirrors
- 13/34 • with light sources co-operating with movable members, e.g. with shutters to cover or uncover the light source (apparatus wherein advertising or display material is moved in a continuous or intermittent succession G09F 11/00)
- 13/36 • • co-operating with rotating screening means
- 13/42 • with light sources activated by non-visible radiation
- 13/44 • with gas as lighting source
- 13/46 • Advertising by fireworks
  
- 15/00 Boards, hoardings, pillars, or like structures for notices, placards, posters, or the like**
- 15/02 • Bills, posters, or the like therefor
  
- 17/00 Flags; Banners; Mountings therefor**
  
- 19/00 Advertising or display means not otherwise provided for**
- 19/02 • incorporating moving display members
- 19/04 • • operated by the opening or closing of doors, e.g. shop door
- 19/06 • • Writing devices

19/08	• • Dolls, faces or other representations of living forms with moving parts	21/16	• • Sky-writing
19/10	• • Devices demonstrating the action of an article to be advertised	21/18	• by ships or other floating means
19/12	• using special optical effects	21/20	• • illuminated
19/14	• • displaying different signs depending upon the view-point of the observer	21/22	• Dispensing devices for pamphlets or similar advertising matter from vehicles (from aircraft B64D 1/00)
19/16	• • involving the use of mirrors	<b>23/00</b>	<b>Advertising on or in specific articles, e.g. ashtrays, letter-boxes</b> (on or in vehicles G09F 21/00)
19/18	• • involving the use of optical projection means, e.g. projection of images on clouds	23/02	• the advertising matter being displayed by the operation of the article
19/20	• • with colour-mixing effects	23/04	• • illuminated
19/22	• Advertising or display means on roads, walls or similar surfaces, e.g. illuminated	23/06	• the advertising matter being combined with articles for restaurants, shops, or offices (on paper articles G09F 23/10)
<b>21/00</b>	<b>Mobile visual advertising</b> (combined visual and audible advertising G09F 27/00)	23/08	• • with tableware
21/02	• by a carrier person or animal	23/10	• on paper articles, e.g. booklets, newspapers
21/04	• by land vehicles	23/12	• • on toilet paper
21/06	• by aeroplanes, airships, balloons, or kites	23/14	• on toys, games, puzzles, or similar devices
21/08	• • the advertising matter being arranged on the aircraft	23/16	• on clocks, e.g. controlled by the clock mechanism
21/10	• • • illuminated	<b>25/00</b>	<b>Audible advertising</b>
21/12	• • the advertising matter being towed by the aircraft	<b>27/00</b>	<b>Combined visual and audible advertising or displaying, e.g. for public address</b>
21/14	• • • illuminated		

**G09G ARRANGEMENTS OR CIRCUITS FOR CONTROL OF INDICATING DEVICES USING STATIC MEANS TO PRESENT VARIABLE INFORMATION** (arrangements for transferring data between digital computers and displays G06F 3/14; static indicating arrangements comprising an association of a number of separate sources or light control cells G09F 9/00; static indicating arrangements comprising integral associations of a number of light sources H01J, H01K, H01L, H05B 33/12; scanning, transmission or reproduction of documents or the like, e.g. facsimile transmission, details thereof H04N 1/00) [3, 4, 5]

#### Note(s)

1. This subclass covers indicator consoles, i.e. arrangements or circuits for processing control signals to achieve the display, e.g. for the calling up, reception, storage, regeneration, coding, decoding, addressing of control signals.
2. This subclass does not cover the structural details of the indicating devices, such as panels or tubes per se, or assemblies of individual light sources, which are covered by the relevant subclasses, e.g. H01J, H01K, H01L, G02F, G09F, H05B.
3. Contrary to subclass H04N, in which are classified display devices capable of representing continuous brightness value scales, this subclass is limited to devices using only a discrete number of brightness values, e.g. visible/non-visible.
4. The visual effect may be produced by a luminescent screen scanned by an electron beam, directly by controlled light sources, by projection of light, from controlled light sources onto characters, symbols, or elements thereof drawn on a support, or by electric, magnetic, or acoustic control of the parameters of light rays from an independent source.

<b>1/00</b>	<b>Control arrangements or circuits, of interest only in connection with cathode-ray tube indicators [3]</b>	1/16	• • • the pattern of rectangular co-ordinates extending over the whole area of the screen, i.e. television type raster [3]
1/02	• Storage circuits (G09G 1/06-G09G 1/28 take precedence) [3]	1/18	• • • a small local pattern covering only a single character, and stepping to a position for the following character, e.g. in rectangular or polar co-ordinates, or in the form of a framed star [3]
1/04	• Deflection circuits [3]	1/20	• using multi-beam tubes (G09G 1/26, G09G 1/28 take precedence) [3]
1/06	• using single beam tubes (G09G 1/26, G09G 1/28 take precedence) [3]	1/22	• using tubes permitting selection of a complete character from a number of characters [3]
1/07	• • with combined raster scan and calligraphic display [5]	1/24	• using tubes permitting selection of individual elements forming in combination a character [3]
1/08	• • the beam directly tracing characters, the information to be displayed controlling the deflection as a function of time in two spatial co-ordinates, e.g. according to a cartesian co-ordinate system [3]	1/26	• using storage tubes [3]
1/10	• • • the deflection signals being produced by essentially digital means, e.g. incrementally [3]	1/28	• using colour tubes [3]
1/12	• • • the deflection signals being produced by essentially analogue means [3]	<b>3/00</b>	<b>Control arrangements or circuits, of interest only in connection with visual indicators other than cathode-ray tubes [3]</b>
1/14	• • the beam tracing a pattern independent of the information to be displayed, this latter determining the parts of the pattern rendered respectively visible and invisible [3]	3/02	• by tracing or scanning a light beam on a screen [3]

- 3/04 • for presentation of a single character by selection from a plurality of characters, or by composing the character by combination of individual elements, e.g. segments [3]
- 3/06 • • using controlled light sources [3]
- 3/08 • • • using incandescent filaments [3]
- 3/10 • • • using gas tubes [3]
- 3/12 • • • using electroluminescent elements [3]
- 3/14 • • • • Semiconductor devices, e.g. diodes [3]
- 3/16 • • by control of light from an independent source [3]
- 3/18 • • • using liquid crystals [3]
- 3/19 • • • using electrochromic devices [5]
- 3/20 • for presentation of an assembly of a number of characters, e.g. a page, by composing the assembly by combination of individual elements arranged in a matrix [3]
- 3/22 • • using controlled light sources [3]
- 3/24 • • • using incandescent filaments [3]
- 3/26 • • • • to give the appearance of moving signs [3]
- 3/28 • • • using luminous gas-discharge panels, e.g. plasma panels [3, 2013.01]
- 3/2807 • • • • with discharge activated by high-frequency signals specially adapted therefor [2013.01]
- 3/2813 • • • • using alternating current [AC] - direct current [DC] hybrid-type panels [2013.01]
- 3/282 • • • • using DC panels [7]
- 3/285 • • • • • using self-scanning [7]
- 3/288 • • • • using AC panels [7, 2013.01]
- 3/29 • • • • • using self-shift panels [5]
- 3/291 • • • • • controlling the gas discharge to control a cell condition, e.g. by means of specific pulse shapes [2013.01]
- 3/292 • • • • • • for reset discharge, priming discharge or erase discharge occurring in a phase other than addressing [2013.01]
- 3/293 • • • • • • for address discharge [2013.01]
- 3/294 • • • • • • for lighting or sustain discharge [2013.01]
- 3/296 • • • • • Driving circuits for producing the waveforms applied to the driving electrodes [2013.01]
- 3/297 • • • • • using opposed discharge type panels [2013.01]
- 3/298 • • • • • using surface discharge panels [2013.01]
- 3/299 • • • • • using alternate lighting of surface-type panels [2013.01]
- 3/30 • • • using electroluminescent panels [3]
- 3/32 • • • • semiconductive, e.g. diodes [3]
- 3/34 • • by control of light from an independent source [3]
- 3/36 • • • using liquid crystals [3]
- 3/38 • • • using electrochromic devices [5]
- 5/00 Control arrangements or circuits for visual indicators common to cathode-ray tube indicators and other visual indicators [5]**
- 5/02 • characterised by the way in which colour is displayed [5]
- 5/04 • • using circuits for interfacing with colour displays [5]
- 5/06 • • using colour palettes, e.g. look-up tables [5]
- 5/08 • Cursor circuits [5]
- 5/10 • Intensity circuits [5]
- 5/12 • Synchronisation between the display unit and other units, e.g. other display units, video-disc players [5]
- 5/14 • Display of multiple viewports [5]
- 5/16 • Display of right-to-left language [5]
- 5/18 • Timing circuits for raster scan displays (specially adapted for television H04N) [5]
- 5/20 • Function-generator circuits, e.g. circle generators [5]
- 5/22 • characterised by the display of individual characters or indicia using display control signals derived from coded signals representing the characters or indicia with a character-code memory (G09G 5/42 takes precedence) [5, 7]
- 5/24 • • Generation of individual character patterns [5]
- 5/26 • • • for modifying the character dimension, e.g. double width, double height [5]
- 5/28 • • • for enhancement of character form, e.g. smoothing [5]
- 5/30 • • Control of display attribute [5]
- 5/32 • • with means for controlling the display position [5]
- 5/34 • for rolling or scrolling [5]
- 5/36 • characterised by the display of individual graphic patterns using a bit-mapped memory (G09G 5/42 takes precedence) [5, 7]
- 5/37 • • Details of the operation on graphic patterns (G09G 5/38 takes precedence) [7]
- 5/373 • • • for modifying the size of the graphic pattern [7]
- 5/377 • • • for mixing or overlaying two or more graphic patterns (G09G 5/02, G09G 5/397 take precedence) [7]
- 5/38 • • with means for controlling the display position [5]
- 5/39 • • Control of the bit-mapped memory [7]
- 5/391 • • • Resolution modifying circuits, e.g. variable screen formats [7]
- 5/393 • • • Arrangements for updating the contents of the bit-mapped memory [7]
- 5/395 • • • Arrangements specially adapted for transferring the contents of the bit-mapped memory to the screen (G09G 5/399 takes precedence) [7]
- 5/397 • • • • Arrangements specially adapted for transferring the contents of two or more bit-mapped memories to the screen simultaneously, e.g. for mixing or overlay (G09G 5/02 takes precedence) [7]
- 5/399 • • • using two or more bit-mapped memories, the operations of which are switched in time, e.g. ping-pong buffers [7]
- 5/40 • characterised by the way in which both a pattern determined by character code and another pattern are displayed simultaneously, or either pattern is displayed selectively, e.g. with character code memory and a bit-mapped memory [5]
- 5/42 • characterised by the display of patterns using a display memory without fixed position correspondence between the display memory contents and the display position on the screen [7]

## G10 MUSICAL INSTRUMENTS; ACOUSTICS

### Note(s)

1. This class covers all sound-emitting devices, in general, whether or not they may be considered as being musical.
2. In this class, the following expression is used with the meaning indicated:
  - "musical instrument" does not exclude devices emitting a single sound signal.
3. The following Class Index is given in place of subclass indexes, to show the grouping of the elaborations belonging to different subclasses, under the following three fundamental types:
  - wind instruments;
  - string instruments;
  - percussion instruments,
 which relate clearly to the majority of instruments.
4. There are of course some instruments of which the principle of operation belongs less clearly to one of the three types mentioned in Note (3). They correspond to groups G10D 17/00 or G10K 7/00, G10K 9/00 or G10K 15/04, all the other groups normally finding a definite place.

### Class index

#### ACOUSTICS; OPERATIONS ON SOUND WAVES

Speech analysis or synthesis; speech recognition; audio analysis or processing.....G10L  
 Methods or devices for transmission of sound or protection against sound, not otherwise provided for....G10K 11/00, G10K 13/00  
 Acoustics not otherwise provided for.....G10K 15/00

#### WIND INSTRUMENTS

General features; details or accessories.....G10D 7/00, G10D 9/00  
 Organs, harmoniums or similar instruments.....G10B 1/00, G10B 3/00  
 Accordions, concertinas or similar instruments; other types of instruments.....G10D 11/00, G10D 7/00  
 Whistles; horns.....G10K 5/00, G10K 9/00

#### STRINGED INSTRUMENTS

General features; details or accessories.....G10D 1/00, G10D 3/00  
 Pianos, harpsichords, spinets or similar stringed musical instruments with one or more keyboards; tools and methods for the manufacture or maintenance thereof.....G10C 1/00, G10C 3/00, G10C 9/00  
 Other instruments.....G10D 1/00

#### PERCUSSION INSTRUMENTS

Bells, rattles or similar instruments.....G10K 1/00, G10K 3/00  
 Other instruments.....G10D 13/00

#### OTHER PARTICULAR DEVICES; DEVICES USING UNDEFINED PRINCIPLES; COMBINATIONS

#### OF INSTRUMENTS; MUSIC ACCESSORIES

Electroponic musical instruments.....G10H  
 Automatic musical instruments.....G10F  
 Sirens; devices with vibrators.....G10K 7/00, G10K 9/00  
 Combinations: of pianos with other instruments; of other instruments.....G10C 5/00, G10D 15/00  
 Music accessories.....G10G

INSTRUMENTS NOT OTHERWISE PROVIDED FOR.....G10D 17/00

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**G10B**     **ORGANS, HARMONIUMS OR LIKE MUSICAL INSTRUMENTS WITH ASSOCIATED BLOWING APPARATUS** (non-musical aspects of musical toy instruments A63H 5/00; accordions, concertinas or the like or keyboards therefor G10D 11/00; automatic wind instruments G10F 1/12)

#### 1/00     General design

- 1/02     • of organs
- 1/04     • • electrically operated
- 1/06     • • fluid operated
- 1/08     • of harmoniums

#### 3/00     Details or accessories

- 3/02     • Blowers
- 3/04     • Reservoirs
- 3/06     • Valves; Sleeves

- 3/08     • Pipes, e.g. open pipes or reed pipes
- 3/10     • Actions, e.g. couplers
- 3/12     • Keys or keyboards; Manuals
- 3/14     • Pedals or pedal boards
- 3/16     • Swell chambers; Accentuating means
- 3/18     • Tremolo-producing devices
- 3/20     • Transposing devices
- 3/22     • Details specially adapted for electrically-operated organs, e.g. contacts therein

## G10B

**G10C PIANOS, HARPSICHORDS, SPINETS OR SIMILAR STRINGED MUSICAL INSTRUMENTS WITH ONE OR MORE KEYBOARDS** (non-musical aspects of toy pianos A63H 5/00; automatic pianos with or without keyboards G10F 1/02, G10F 1/04; combination instruments incorporating an automatic piano G10F 1/22; details or accessories of automatic pianos G10F 5/00)

<b>1/00</b>	<b>General design</b>	3/18	• • Hammers
1/02	• of upright pianofortes	3/20	• • involving the use of hydraulic, pneumatic, or electromagnetic means
1/04	• of grand pianofortes	3/22	• • for grand pianofortes
1/06	• of harpsichords, spinets or similar stringed instruments	3/24	• • for reciprocating of tremolo
<b>3/00</b>	<b>Details or accessories</b>	3/26	• Pedals or pedal mechanisms for half-blow or similar means for modifying the sound
3/02	• Cases	3/28	• Transposing devices
3/04	• Frames; Bridges; Bars	3/30	• Couplers, e.g. for playing octaves
3/06	• Resonating means, e.g. resonant strings, soundboards; Fastenings of the resonating means	<b>5/00</b>	<b>Combinations with other musical instruments, e.g. with bells or xylophones</b>
3/08	• Arrangements of strings	<b>9/00</b>	<b>Methods or tools specially adapted for the manufacture or maintenance of musical instruments covered by this subclass</b>
3/10	• Tuning pins or straining devices		
3/12	• Keyboards; Keys		
3/14	• • for actuation by the feet		
3/16	• Actions		

**G10D STRINGED MUSICAL INSTRUMENTS; WIND MUSICAL INSTRUMENTS; ACCORDIONS OR CONCERTINAS; PERCUSSION MUSICAL INSTRUMENTS; MUSICAL INSTRUMENTS NOT OTHERWISE PROVIDED FOR** (non-musical aspects of musical toy instruments A63H 5/00; organs, harmoniums or like musical instruments with associated blowing apparatus G10B; pianos, harpsichords, spinets or similar stringed musical instruments with one or more keyboards G10C; automatic musical instruments G10F; electrophonic musical instruments G10H; instruments in which the tones are generated by electromechanical means or electronic generators, or in which the tones are synthesised from a data store G10H)

### Note(s) [2010.01]

1. This subclass covers certain stringed musical instruments that can optionally include a keyboard, e.g. zithers.
2. This subclass does not cover pianos, harpsichords, spinets or similar stringed instruments provided by design with one or more keyboards, which are covered by subclass G10C.

<b>1/00</b>	<b>General design of stringed musical instruments</b> (instruments with one or more keyboards G10C)	7/04	• • Ocarinas
1/02	• of violins, violas, violoncellos, basses	7/06	• of the type with a beating reed or reeds, e.g. oboes, clarinets, bassoons or bagpipes
1/04	• of harps, lyres	7/08	• • Saxophones
1/06	• of mandolins	7/10	• of the type with a cupped mouthpiece, e.g. cornets, orchestral trumpets or trombones
1/08	• of guitars	7/12	• of the type with free reeds, e.g. mouth-organs or trumpets for children
1/10	• of banjos	<b>9/00</b>	<b>Details of, or accessories for, wind musical instruments</b>
1/12	• of zithers, e.g. autoharp	9/02	• Mouthpieces; Reeds
<b>3/00</b>	<b>Details of, or accessories for, stringed musical instruments, e.g. slide-bars</b>	9/04	• Valves; Valve controls
3/02	• Resonating means, horns, or diaphragms	9/06	• Mutes
3/04	• Bridges, mutes, or capo-tastos	<b>11/00</b>	<b>Accordions, concertinas or the like; Keyboards therefor</b>
3/06	• Fingerboards	11/02	• Actions
3/08	• • in the form of keyboards	<b>13/00</b>	<b>Percussion musical instruments; Details or accessories</b>
3/10	• Strings	13/02	• Drums; Tambourines
3/12	• Anchoring devices for strings, e.g. tail pieces or hitchpins	13/04	• Timpani
3/14	• Tuning devices, e.g. pegs, pins or friction discs	13/06	• Castanets, cymbals, triangles or other single-toned percussion musical instruments
3/16	• Bows; Guides for bows; Plectra or like playing means	13/08	• Multi-toned musical instruments, with sonorous bars, blocks, forks, gongs, plates, rods, or teeth
3/18	• Chin-rests, hand-rests or guards as part of the instrument		
<b>7/00</b>	<b>General design of wind musical instruments</b> (accordions or concertinas G10D 11/00; whistles G10K 5/00)		
7/02	• of the type wherein an air current is directed against a ramp edge, e.g. flutes or recorders		

**15/00 Combinations of different musical instruments**  
(combinations with pianos, harpsichords, spinets or similar stringed instruments with one or more keyboards G10C 5/00)

**17/00 Musical instruments not provided for in any other group of this subclass, e.g. Aeolian harp, singing-flame musical instrument**

**G10F AUTOMATIC MUSICAL INSTRUMENTS** (non-musical aspects of musical toy instruments A63H 5/00; arrangements for the associated working of recording or reproducing apparatus with automatic musical instruments G11B 31/02)

#### **Note(s)**

This subclass does not cover aspects of musical instruments which are independent of the automatic actuation, which are covered by subclass G10B, G10C or G10D.

#### **1/00 Automatic musical instruments**

- 1/02 • Pianofortes with keyboard
- 1/04 • Pianofortes which have no keyboard
- 1/06 • Musical boxes with plucked teeth, blades, or the like (combinations with other articles, see the relevant classes for the articles)
- 1/08 • Percussion instruments
- 1/10 • • Carillons
- 1/12 • Wind instruments
- 1/14 • • Barrel-organs
- 1/16 • Stringed instruments other than pianofortes

1/18 • • to be played by a bow

1/20 • • to be plucked

1/22 • Combinations of two or more instruments

#### **3/00 Independent players for keyboard instruments**

#### **5/00 Details or accessories**

5/02 • Actions

5/04 • Tune barrels, sheets, rollers, spools, or the like

5/06 • • Driving or setting of tune barrels, discs, or the like; Winding, rewinding, or guiding of tune sheets or the like

**G10G AIDS FOR MUSIC; SUPPORTS FOR MUSICAL INSTRUMENTS; OTHER AUXILIARY DEVICES OR ACCESSORIES FOR MUSIC OR MUSICAL INSTRUMENTS** (music stands A47B; non-musical aspects of musical toy instruments A63H 5/00; metronomes G04F 5/02; teaching music G09B 15/00)

#### **1/00 Means for the representation of music**

- 1/02 • Chord or note indicators, fixed or adjustable, for keyboards or fingerboards
- 1/04 • Transposing; Transcribing

#### **3/00 Recording music in notation form, e.g. recording the mechanical operation of a musical instrument**

- 3/02 • using mechanical means only

3/04 • using electrical means

#### **5/00 Supports for musical instruments**

#### **7/00 Other auxiliary devices or accessories, e.g. conductors' batons or separate holders for resin or strings**

7/02 • Tuning forks or like devices

**G10H ELECTROPHONIC MUSICAL INSTRUMENTS; INSTRUMENTS IN WHICH THE TONES ARE GENERATED BY ELECTROMECHANICAL MEANS OR ELECTRONIC GENERATORS, OR IN WHICH THE TONES ARE SYNTHESISED FROM A DATA STORE**

#### **Note(s)**

This subclass covers musical instruments in which individual notes are constituted as electric oscillations under the control of a performer and the oscillations are converted to sound-vibrations by a loudspeaker or equivalent device.

#### **1/00 Details of electrophonic musical instruments**

(keyboards applicable also to other musical instruments G10B, G10C; arrangements for producing a reverberation or echo sound G10K 15/08) [5]

- 1/02 • Means for controlling the tone frequencies, e.g. attack or decay; Means for producing special musical effects, e.g. vibratos or glissandos
- 1/04 • • by additional modulation
- 1/043 • • • Continuous modulation [3]
- 1/045 • • • • by electromechanical means [3]
- 1/047 • • • • by acousto-mechanical means, e.g. rotating speakers or sound deflectors [3]
- 1/053 • • • during execution only [3]

1/055 • • • • by switches with variable impedance elements [3]

1/057 • • • • by envelope-forming circuits [3]

1/06 • • Circuits for establishing the harmonic content of tones

1/08 • • • by combining tones (G10H 1/14, G10H 1/16 take precedence; chord G10H 1/38; speech analysis or synthesis, G10L) [3]

1/10 • • • • for obtaining chorus, celeste or ensemble effects (continuous modulation G10H 1/043) [3]

1/12 • • • by filtering complex waveforms (G10H 1/14, G10H 1/16 take precedence) [3]

## G10H

- 1/14 • • • during execution (modulation during execution G10H 1/053) [3]
- 1/16 • • • by non-linear elements (G10H 1/14 takes precedence; generation of non-sinusoidal basic tones G10H 5/10) [3]
- 1/18 • Selecting circuits [3]
- 1/20 • • for transposition [3]
- 1/22 • • for suppressing tones; Preference networks [3]
- 1/24 • • for selecting plural preset register stops [3]
- 1/26 • • for automatically producing a series of tones [3]
- 1/28 • • • to produce arpeggios [3]
- 1/30 • • • to reiteratively sound two tones [3]
- 1/32 • Constructional details [3]
- 1/34 • • Switch arrangements, e.g. keyboards or mechanical switches peculiar to electrophonic musical instruments (keyboards applicable also to other musical instruments G10B, G10C) [3]
- 1/36 • Accompaniment arrangements [3]
- 1/38 • • Chord [3]
- 1/40 • • Rhythm (metronomes G04F 5/02) [3]
- 1/42 • • • comprising tone forming circuits [3]
- 1/44 • Tuning means [3]
- 1/46 • Volume control [3]

### 3/00 Instruments in which the tones are generated by electromechanical means

- 3/02 • using mechanical interrupters
- 3/03 • using pick-up means for reading recorded waves, e.g. on rotating discs [3]
- 3/06 • • using photoelectric pick-up means
- 3/08 • • using inductive pick-up means
- 3/09 • • • using tapes or wires [3]
- 3/10 • • using capacitive pick-up means
- 3/12 • using mechanical resonant generators, e.g. strings or percussion instruments, the tones of which are picked up by electromechanical transducers, the electrical signals being further manipulated or amplified and subsequently converted to sound by a loudspeaker or equivalent device [3]
- 3/14 • • using mechanically actuated vibrators with pick-up means (G10H 3/24 takes precedence) [3]
- 3/16 • • • using a reed [3]
- 3/18 • • • using strings, e.g. electric guitars [3]

- 3/20 • • • using a tuning fork, rod or tube [3]
- 3/22 • • using electromechanically actuated vibrators with pick-up means (G10H 3/24 takes precedence) [3]
- 3/24 • • incorporating feedback means, e.g. acoustic [3]
- 3/26 • • • using electric feedback [3]

### 5/00 Instruments in which the tones are generated by means of electronic generators (G10H 7/00 takes precedence) [3]

- 5/02 • using generation of basic tones
- 5/04 • • with semiconductor devices as active elements (G10H 5/10, G10H 5/12 take precedence)
- 5/06 • • tones generated by frequency multiplication or division of a basic tone
- 5/07 • • • resulting in complex waveforms [3]
- 5/08 • • tones generated by heterodyning
- 5/10 • using generation of non-sinusoidal basic tones, e.g. sawtooth
- 5/12 • • using semiconductor devices as active elements
- 5/14 • using electromechanical resonators, e.g. quartz crystals, as frequency-determining elements [3]
- 5/16 • using cathode ray tubes [3]

### 7/00 Instruments in which the tones are synthesised from a data store, e.g. computer organs (synthesis of acoustic waves not specific to musical instruments G10K 15/02, G10L) [3, 5]

- 7/02 • in which amplitudes at successive sample points of a tone waveform are stored in one or more memories [5]
- 7/04 • • in which amplitudes are read at varying rates, e.g. according to pitch [5]
- 7/06 • • in which amplitudes are read at a fixed rate, the read-out address varying stepwise by a given value, e.g. according to pitch [5]
- 7/08 • by calculating functions or polynomial approximations to evaluate amplitudes at successive sample points of a tone waveform [5]
- 7/10 • • using coefficients or parameters stored in a memory, e.g. Fourier coefficients (G10H 7/12 takes precedence) [5]
- 7/12 • • by means of a recursive algorithm using one or more sets of parameters stored in a memory and the calculated amplitudes of one or more preceding sample points [5]

## G10K SOUND-PRODUCING DEVICES (sound-producing toys A63H 5/00); METHODS OR DEVICES FOR PROTECTING AGAINST, OR FOR DAMPING, NOISE OR OTHER ACOUSTIC WAVES IN GENERAL; ACOUSTICS NOT OTHERWISE PROVIDED FOR [6]

### Note(s)

1. This subclass covers arrangements for generating mechanical vibrations in fluids.
2. This subclass covers also the production of sounds which may not be audible to human beings but which are audible to animals.
3. In this subclass, the following terms are used with the meanings indicated:
  - "acoustics" and "sound" cover the technical field dealing with mechanical vibrations at all infrasonic-, sonic- and ultrasonic frequencies. However, generation or transmission of mechanical waves, in general, is covered by subclass B06B, subject to the exception specified in Note (1) above.

- 1/00 **Devices in which sound is produced by striking a resonating body, e.g. bells, chimes or gongs** (combinations with clocks or watches G04B, G04C; multi-toned musical instruments G10D 13/08; automatic carillons G10F 1/10)
- 1/06 • the resonating device having the shape of a bell, plate, rod, or tube (bells for towers G10K 1/28)

- 1/062 • • electrically operated
- 1/063 • • • the sounding member being a bell
- 1/064 • • • • Operating or striking mechanisms therefor
- 1/065 • • • • for timed or repeated operation
- 1/066 • • • the sounding member being a tube, plate, or rod
- 1/067 • • • • Operating or striking mechanisms therefor

- 1/068 • • hydraulically operated; pneumatically operated
- 1/07 • • mechanically operated; Hand bells; Bells for animals
- 1/071 • • • Hand bells; Bells for animals
- 1/072 • • • Operating or striking mechanisms therefor
- 1/074 • • • • with rotary clappers or shells
- 1/076 • • • • for timed or repeated operation
- 1/08 • • Details or accessories of general applicability
- 1/10 • • • Sounding members; Mounting thereof; Clappers or other strikers
- 1/26 • • • Mountings; Casings
- 1/28 • Bells for towers or the like
- 1/30 • • Details or accessories
- 1/32 • • • Sounding members; Clappers or other strikers
- 1/34 • • • Operating mechanisms
- 1/36 • • • Means for silencing or damping (means or arrangements for avoiding or reducing out-of-balance forces due to motion F16F 15/00)
- 1/38 • • • Supports; Mountings

### 3/00 Rattles or like noise-producing devices

#### 5/00 Whistles

- 5/02 • Ultrasonic whistles [3]

#### 7/00 Sirens

- 7/02 • in which the sound-producing member is rotated manually or by a motor (G10K 7/06 takes precedence)
- 7/04 • • by an electric motor
- 7/06 • in which the sound-producing member is driven by a fluid, e.g. by a compressed gas

#### 9/00 Devices in which sound is produced by vibrating a diaphragm or analogous element, e.g. fog horns, vehicle hooters or buzzers (loudspeakers or like acoustic electromechanical transducers H04R)

- 9/02 • driven by gas, e.g. suction operated
- 9/04 • • by compressed gases, e.g. compressed air
- 9/06 • • produced by detonation
- 9/08 • driven by water or other liquids
- 9/10 • driven by mechanical means only
- 9/12 • electrically operated

#### Note(s)

This group does not cover the construction of, or circuits for, broadband-transducers such as loudspeakers or microphones, which are covered by subclass H04R.

- 9/122 • • using piezo-electric driving means [6]
- 9/125 • • • with a plurality of active elements [6]
- 9/128 • • using magnetostrictive driving means [6]
- 9/13 • • using electromagnetic driving means [3]
- 9/15 • • • Self-interrupting arrangements [3]
- 9/16 • • with means for generating the current by muscle power
- 9/18 • Details, e.g. bulbs, pumps, pistons, switches or casings
- 9/20 • • Sounding members
- 9/22 • • Mountings; Casings

#### 11/00 Methods or devices for transmitting, conducting or directing sound in general; Methods or devices for protecting against, or for damping, noise or other acoustic waves in general

- 11/02 • Mechanical acoustic impedances; Impedance matching, e.g. by horns; Acoustic resonators [3]
- 11/04 • • Acoustic filters [3]
- 11/08 • Non-electric sound-amplifying devices, e.g. non-electric megaphones (amplifying by horns G10K 11/02; amplifying by focusing G10K 11/26)
- 11/16 • Methods or devices for protecting against, or for damping, noise or other acoustic waves in general (G10K 11/36 takes precedence) [3]
- 11/162 • • Selection of materials [6]
- 11/165 • • • Particles in a matrix [6]
- 11/168 • • • Plural layers of different materials, e.g. sandwiches [6]

#### Note(s)

When classifying in this group, classification is also made in subclass B32B, insofar as any layered product is concerned.

- 11/172 • • using resonance effects [6]
- 11/175 • • using interference effects; Masking sound [6]
- 11/178 • • • by electro-acoustically regenerating the original acoustic waves in anti-phase [6]
- 11/18 • Methods or devices for transmitting, conducting or directing sound (G10K 11/02, G10K 11/36 take precedence; medical stethoscopes A61B 7/02) [3]
- 11/20 • • Reflecting arrangements (G10K 11/28 takes precedence) [3]
- 11/22 • • for conducting sound through hollow pipes, e.g. speaking tubes [3]
- 11/24 • • for conducting sound through solid bodies, e.g. wires [3]
- 11/26 • • Sound-focusing or directing, e.g. scanning [3]
- 11/28 • • • using reflection, e.g. parabolic reflectors [3]
- 11/30 • • • using refraction, e.g. acoustic lenses [3]
- 11/32 • • • characterised by shape of the source [3]
- 11/34 • • • using electrical steering of transducer arrays, e.g. beam steering [3]
- 11/35 • • • using mechanical steering of transducers [6]
- 11/36 • Devices for manipulating acoustic surface waves (electro-acoustic amplifiers H03F 13/00; networks comprising electro-acoustic elements H03H 9/00) [3]

#### 13/00 Cones, diaphragms, or the like, for emitting or receiving sound in general (for electromechanical transducers H04R 7/00)

#### 15/00 Acoustics not otherwise provided for [4]

- 15/02 • Synthesis of acoustic waves (synthesis of speech G10L 13/00) [4]
- 15/04 • Sound-producing devices (G10K 15/02 takes precedence) [4]
- 15/06 • • using electric discharge [4]
- 15/08 • Arrangements for producing a reverberation or echo sound [5]
- 15/10 • • using time-delay networks comprising electromechanical or electro-acoustic devices [5]
- 15/12 • • using electronic time-delay networks [5]

**G10L SPEECH ANALYSIS OR SYNTHESIS; SPEECH RECOGNITION; SPEECH OR VOICE PROCESSING; SPEECH OR AUDIO CODING OR DECODING [4]**
**Note(s) [2010.01]**

This subclass does not cover:

- devices for the storage of speech or audio signals, which are covered by subclasses G11B and G11C;
- encoding of compressed speech signals for transmission or storage, which is covered by group H03M 7/30.

<b>13/00</b>	<b>Speech synthesis; Text to speech systems [7]</b>	15/193	• • • • • Formal grammars, e.g. finite state automata, context free grammars or word networks [2013.01]
13/02	• Methods for producing synthetic speech; Speech synthesisers [7, 2013.01]	15/197	• • • • • Probabilistic grammars, e.g. word n-grams [2013.01]
13/027	• • Concept to speech synthesisers; Generation of natural phrases from machine-based concepts (generation of parameters for speech synthesis out of text G10L 13/08) [2013.01]	15/20	• Speech recognition techniques specially adapted for robustness in adverse environments, e.g. in noise or of stress induced speech (G10L 21/02 takes precedence) [7]
13/033	• • Voice editing, e.g. manipulating the voice of the synthesiser [2013.01]	15/22	• Procedures used during a speech recognition process, e.g. man-machine dialog [7]
13/04	• • Details of speech synthesis systems, e.g. synthesiser structure or memory management [7, 2013.01]	15/24	• Speech recognition using non-acoustical features [7, 2013.01]
13/047	• • • Architecture of speech synthesisers [2013.01]	15/25	• • using position of the lips, movement of the lips or face analysis [2013.01]
13/06	• Elementary speech units used in speech synthesisers; Concatenation rules [7, 2013.01]	15/26	• Speech to text systems (G10L 15/08 takes precedence) [7]
13/07	• • Concatenation rules [2013.01]	15/28	• Constructional details of speech recognition systems [7, 2013.01]
13/08	• Text analysis or generation of parameters for speech synthesis out of text, e.g. grapheme to phoneme translation, prosody generation or stress or intonation determination [7, 2013.01]	15/30	• • Distributed recognition, e.g. in client-server systems, for mobile phones or network applications [2013.01]
13/10	• • Prosody rules derived from text; Stress or intonation [2013.01]	15/32	• • Multiple recognisers used in sequence or in parallel; Score combination systems therefor, e.g. voting systems [2013.01]
<b>15/00</b>	<b>Speech recognition (G10L 17/00 takes precedence) [7, 2013.01]</b>	15/34	• • Adaptation of a single recogniser for parallel processing, e.g. by use of multiple processors or cloud computing [2013.01]
15/01	• Assessment or evaluation of speech recognition systems [2013.01]	<b>17/00</b>	<b>Speaker identification or verification [7, 2013.01]</b>
15/02	• Feature extraction for speech recognition; Selection of recognition unit [7]	17/02	• Preprocessing operations, e.g. segment selection; Pattern representation or modelling, e.g. based on linear discriminant analysis [LDA] or principal components; Feature selection or extraction [2013.01]
15/04	• Segmentation; Word boundary detection [7, 2013.01]	17/04	• Training, enrolment or model building [2013.01]
15/05	• • Word boundary detection [2013.01]	17/06	• Decision making techniques; Pattern matching strategies [2013.01]
15/06	• Creation of reference templates; Training of speech recognition systems, e.g. adaptation to the characteristics of the speaker's voice (G10L 15/14 takes precedence) [7, 2013.01]	17/08	• • Use of distortion metrics or a particular distance between probe pattern and reference templates [2013.01]
15/065	• • Adaptation [2013.01]	17/10	• • Multimodal systems, i.e. based on the integration of multiple recognition engines or fusion of expert systems [2013.01]
15/07	• • • to the speaker [2013.01]	17/12	• • Score normalisation [2013.01]
15/08	• Speech classification or search [7]	17/14	• • Use of phonemic categorisation or speech recognition prior to speaker recognition or verification [2013.01]
15/10	• • using distance or distortion measures between unknown speech and reference templates [7]	17/16	• Hidden Markov models [HMMs] [2013.01]
15/12	• • using dynamic programming techniques, e.g. dynamic time warping [DTW] [7]	17/18	• Artificial neural networks; Connectionist approaches [2013.01]
15/14	• • using statistical models, e.g. Hidden Markov Models [HMM] (G10L 15/18 takes precedence) [7]	17/20	• Pattern transformations or operations aimed at increasing system robustness, e.g. against channel noise or different working conditions [2013.01]
15/16	• • using artificial neural networks [7]	17/22	• Interactive procedures; Man-machine interfaces [2013.01]
15/18	• • using natural language modelling [7, 2013.01]		
15/183	• • • using context dependencies, e.g. language models [2013.01]		
15/187	• • • Phonemic context, e.g. pronunciation rules, phonotactical constraints or phoneme n-grams [2013.01]		
15/19	• • • Grammatical context, e.g. disambiguation of recognition hypotheses based on word sequence rules [2013.01]		

- 17/24 • • • the user being prompted to utter a password or a predefined phrase **[2013.01]**
- 17/26 • Recognition of special voice characteristics, e.g. for use in lie detectors; Recognition of animal voices **[2013.01]**
- 19/00 Speech or audio signal analysis-synthesis techniques for redundancy reduction, e.g. in vocoders; Coding or decoding of speech or audio signals, using source filter models or psychoacoustic analysis (in musical instruments G10H) [7, 2013.01]**
- 19/002 • Dynamic bit allocation (for perceptual audio coders G10L 19/032) **[2013.01]**
- 19/005 • Correction of errors induced by the transmission channel, if related to the coding algorithm **[2013.01]**
- 19/008 • Multichannel audio signal coding or decoding using interchannel correlation to reduce redundancy, e.g. joint-stereo, intensity-coding or matrixing **[2013.01]**
- 19/012 • Comfort noise or silence coding **[2013.01]**
- 19/018 • Audio watermarking, i.e. embedding inaudible data in the audio signal **[2013.01]**
- 19/02 • using spectral analysis, e.g. transform vocoders or subband vocoders **[7, 2013.01]**
- 19/022 • • Blocking, i.e. grouping of samples in time; Choice of analysis windows; Overlap factoring **[2013.01]**
- 19/025 • • • Detection of transients or attacks for time/frequency resolution switching **[2013.01]**
- 19/028 • • Noise substitution, e.g. substituting non-tonal spectral components by noisy source (comfort noise for discontinuous speech transmission G10L 19/012) **[2013.01]**
- 19/03 • • Spectral prediction for preventing pre-echo; Temporary noise shaping [TNS], e.g. in MPEG2 or MPEG4 **[2013.01]**
- 19/032 • • Quantisation or dequantisation of spectral components **[2013.01]**
- 19/035 • • • Scalar quantisation **[2013.01]**
- 19/038 • • • Vector quantisation, e.g. TwinVQ audio **[2013.01]**
- 19/04 • using predictive techniques **[7, 2013.01]**
- 19/06 • • Determination or coding of the spectral characteristics, e.g. of the short-term prediction coefficients **[7, 2013.01]**
- 19/07 • • • Line spectrum pair [LSP] vocoders **[2013.01]**
- 19/08 • • Determination or coding of the excitation function; Determination or coding of the long-term prediction parameters **[7, 2013.01]**
- 19/083 • • • the excitation function being an excitation gain (G10L 25/90 takes precedence) **[2013.01]**
- 19/087 • • • using mixed excitation models, e.g. MELP, MBE, split band LPC or HVXC **[2013.01]**
- 19/09 • • • Long term prediction, i.e. removing periodical redundancies, e.g. by using adaptive codebook or pitch predictor **[2013.01]**
- 19/093 • • • using sinusoidal excitation models **[2013.01]**
- 19/097 • • • using prototype waveform decomposition or prototype waveform interpolative [PWI] coders **[2013.01]**
- 19/10 • • • the excitation function being a multipulse excitation **[7, 2013.01]**
- 19/107 • • • • Sparse pulse excitation, e.g. by using algebraic codebook **[2013.01]**
- 19/113 • • • • Regular pulse excitation **[2013.01]**
- 19/12 • • • the excitation function being a code excitation, e.g. in code excited linear prediction [CELP] vocoders **[7, 2013.01]**
- 19/125 • • • • Pitch excitation, e.g. pitch synchronous innovation CELP [PSI-CELP] **[2013.01]**
- 19/13 • • • • Residual excited linear prediction [RELPE] **[2013.01]**
- 19/135 • • • • Vector sum excited linear prediction [VSELP] **[2013.01]**
- 19/16 • • • Vocoder architecture **[2013.01]**
- 19/18 • • • • Vocoders using multiple modes **[2013.01]**
- 19/20 • • • • using sound class specific coding, hybrid encoders or object based coding **[2013.01]**
- 19/22 • • • • Mode decision, i.e. based on audio signal content versus external parameters **[2013.01]**
- 19/24 • • • • Variable rate codecs, e.g. for generating different qualities using a scalable representation such as hierarchical encoding or layered encoding **[2013.01]**
- 19/26 • • • Pre-filtering or post-filtering **[2013.01]**
- 21/00 Processing of the speech or voice signal to produce another audible or non-audible signal, e.g. visual or tactile, in order to modify its quality or its intelligibility (G10L 19/00 takes precedence) [7, 2013.01]**
- 21/003 • Changing voice quality, e.g. pitch or formants **[2013.01]**
- 21/007 • • characterised by the process used **[2013.01]**
- 21/01 • • • Correction of time axis **[2013.01]**
- 21/013 • • • Adapting to target pitch **[2013.01]**
- 21/02 • Speech enhancement, e.g. noise reduction or echo cancellation (reducing echo effects in line transmission systems H04B 3/20; echo suppression in hands-free telephones H04M 9/08) **[7, 2013.01]**
- 21/0208 • • Noise filtering **[2013.01]**
- 21/0216 • • • characterised by the method used for estimating noise **[2013.01]**
- 21/0224 • • • • Processing in the time domain **[2013.01]**
- 21/0232 • • • • Processing in the frequency domain **[2013.01]**
- 21/0264 • • • characterised by the type of parameter measurement, e.g. correlation techniques, zero crossing techniques or predictive techniques **[2013.01]**
- 21/0272 • • • Voice signal separating **[2013.01]**
- 21/028 • • • using properties of sound source **[2013.01]**
- 21/0308 • • • characterised by the type of parameter measurement, e.g. correlation techniques, zero crossing techniques or predictive techniques **[2013.01]**
- 21/0316 • • • by changing the amplitude **[2013.01]**
- 21/0324 • • • Details of processing therefor **[2013.01]**
- 21/0332 • • • • involving modification of waveforms **[2013.01]**
- 21/034 • • • • Automatic adjustment **[2013.01]**
- 21/0356 • • • for synchronising with other signals, e.g. video signals **[2013.01]**
- 21/0364 • • • for improving intelligibility **[2013.01]**
- 21/038 • • • using band spreading techniques **[2013.01]**
- 21/0388 • • • Details of processing therefor **[2013.01]**
- 21/04 • Time compression or expansion **[7, 2013.01]**
- 21/043 • • • by changing speed **[2013.01]**
- 21/045 • • • using thinning out or insertion of a waveform **[2013.01]**
- 21/047 • • • characterised by the type of waveform to be thinned out or inserted **[2013.01]**
- 21/049 • • • • characterised by the interconnection of waveforms **[2013.01]**

## G10L

- 21/055 • • for synchronising with other signals, e.g. video signals [2013.01]
- 21/057 • • for improving intelligibility [2013.01]
- 21/06 • Transformation of speech into a non-audible representation, e.g. speech visualisation or speech processing for tactile aids (G10L 15/26 takes precedence) [7, 2013.01]
- 21/10 • • Transforming into visible information [2013.01]
- 21/12 • • • by displaying time domain information [2013.01]
- 21/14 • • • by displaying frequency domain information [2013.01]
- 21/16 • • Transforming into a non-visible representation (devices or methods enabling ear patients to replace direct auditory perception by another kind of perception A61F 11/04) [2013.01]
- 21/18 • • Details of the transformation process [2013.01]
- 25/00 **Speech or voice analysis techniques not restricted to a single one of groups G10L 15/00-G10L 21/00** (muting semiconductor-based amplifiers when some special characteristics of a signal are sensed by a speech detector, e.g. sensing when no signal is present, H03G 3/34) [2013.01]
- 25/03 • characterised by the type of extracted parameters [2013.01]
- 25/06 • • the extracted parameters being correlation coefficients [2013.01]
- 25/09 • • the extracted parameters being zero crossing rates [2013.01]
- 25/12 • • the extracted parameters being prediction coefficients [2013.01]
- 25/15 • • the extracted parameters being formant information [2013.01]
- 25/18 • • the extracted parameters being spectral information of each sub-band [2013.01]
- 25/21 • • the extracted parameters being power information [2013.01]
- 25/24 • • the extracted parameters being the cepstrum [2013.01]
- 25/27 • characterised by the analysis technique [2013.01]
- 25/30 • • using neural networks [2013.01]
- 25/33 • • using fuzzy logic [2013.01]
- 25/36 • • using chaos theory [2013.01]
- 25/39 • • using genetic algorithms [2013.01]
- 25/45 • characterised by the type of analysis window [2013.01]
- 25/48 • specially adapted for particular use [2013.01]
- 25/51 • • for comparison or discrimination [2013.01]
- 25/54 • • • for retrieval [2013.01]
- 25/57 • • • for processing of video signals [2013.01]
- 25/60 • • • for measuring the quality of voice signals [2013.01]
- 25/63 • • • for estimating an emotional state [2013.01]
- 25/66 • • • for extracting parameters related to health condition (detecting or measuring for diagnostic purposes A61B 5/00) [2013.01]
- 25/69 • • for evaluating synthetic or decoded voice signals [2013.01]
- 25/72 • • for transmitting results of analysis [2013.01]
- 25/75 • for modelling vocal tract parameters [2013.01]
- 25/78 • Detection of presence or absence of voice signals (switching of direction of transmission by voice frequency in two-way loud-speaking telephone systems H04M 9/10) [2013.01]
- 25/81 • • for discriminating voice from music [2013.01]
- 25/84 • • for discriminating voice from noise [2013.01]
- 25/87 • • Detection of discrete points within a voice signal [2013.01]
- 25/90 • Pitch determination of speech signals [2013.01]
- 25/93 • Discriminating between voiced and unvoiced parts of speech signals (G10L 25/90 takes precedence) [2013.01]
- 99/00 **Subject matter not provided for in other groups of this subclass [2013.01]**

## G11 INFORMATION STORAGE

**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 G01D 9/00; recording or playback apparatus using mechanically marked tape, e.g. punched paper tape, or using unit records, e.g. punched or magnetically marked cards G06K; transferring data from one type of record carrier to another G06K 1/18; circuits for coupling output of reproducer to radio receiver H04B 1/20; gramophone pick-ups or like acoustic electromechanical transducers or circuits therefor H04R)

### Note(s)

1. This subclass covers:
  - recording or 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;
  - apparatus and machines for recording or playback, and parts thereof, such as heads;
  - record carriers for use with such apparatus and machines;
  - associated working of other apparatus with such apparatus and machines.
2. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "record carrier" means 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 record carrier;
  - "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;

- "near-field interaction" means a very short distance interaction using scanning-probe techniques, e.g. quasi- contact or evanescent contact between head and record carrier.
3. Attention is drawn to the Notes following the titles of class B81 and subclass B81B relating to "micro-structural devices" and "micro-structural systems".

### Subclass index

#### RECORDING OF ONE TYPE ASSOCIATED WITH REPRODUCING MEANS OF THE SAME TYPE

Of mechanical type.....	3/00
Of magnetical type.....	5/00
Of optical type.....	7/00
Of another type.....	9/00

#### RECORDING OF ONE TYPE AND ASSOCIATED REPRODUCING MEANS OF DIFFERENT TYPE.....11/00

#### SIMULTANEOUS OR SELECTIVE RECORDING OF DIFFERENT TYPES; ASSOCIATED

#### SIMULTANEOUS OR SELECTIVE REPRODUCING MEANS.....13/00

#### SIGNAL PROCESSING NOT SPECIFIC TO THE METHOD OF RECORDING OR REPRODUCING.....20/00

#### APPARATUS CHARACTERISED BY THE SHAPE OF THE RECORD CARRIER.....25/00

#### DETAILS; GENERAL FEATURES

Starting, stopping, driving.....	15/00, 19/00
Guiding.....	17/00

#### HEADS; RECORD CARRIERS.....21/00, 23/00

#### ASSOCIATED WORKING WITH OTHER APPARATUS.....31/00

#### EDITING, INDEXING, SYNCHRONISING, MONITORING.....27/00

#### MANUFACTURING.....3/70, 5/84, 7/26

#### OTHER CONSTRUCTIONAL PARTS, DETAILS OR ACCESSORIES.....33/00

### 3/00 Recording by mechanical cutting, deforming or pressing, e.g. of grooves or pits; Reproducing by mechanical sensing; Record carriers therefor (G11B 11/00 takes precedence)

- 3/02 • Arrangements of heads
- 3/04 • • Multiple, convertible, or alternative transducing arrangements
- 3/06 • • Determining or indicating position of head
- 3/08 • • Raising, lowering, traversing otherwise than for transducing, arresting, or holding-up heads against record carriers
- 3/085 • • • using automatic means (G11B 3/095 takes precedence) [4]
- 3/09 • • • using manual means only (G11B 3/095 takes precedence) [4]
- 3/095 • • • for repeating a part of the record; for beginning or stopping at a desired point of the record [4]
- 3/10 • • Arranging, supporting, or driving of heads or of transducers relatively to record carriers
- 3/12 • • • Supporting in balanced, counterbalanced, or loaded operative position, e.g. loading in direction of traverse
- 3/14 • • • • by using effects of gravity or inertia, e.g. counterweight (G11B 3/28 takes precedence) [4]
- 3/16 • • • • • adjustable
- 3/18 • • • • • Damping by using viscosity effect
- 3/20 • • • • • by elastic means, e.g. spring (G11B 3/28 takes precedence) [4]
- 3/22 • • • • • adjustable
- 3/24 • • • • • acting to decrease pressure on record
- 3/26 • • • • • acting to increase pressure on record
- 3/28 • • • • • providing transverse bias parallel to record
- 3/30 • • • Supporting in inoperative position
- 3/31 • • • • Construction of arms [4]
- 3/32 • • • • Construction or arrangement of support pillars
- 3/34 • • • Driving or guiding during transducing operation

- 3/36 • • • • Automatic-feed mechanisms producing progressive transducing traverse across record carriers otherwise than by grooves, e.g. by lead-screw
- 3/38 • • • • Guiding, e.g. constructions or arrangements providing linear or other special tracking characteristics
- 3/40 • • • • Driving of heads relatively to stationary record carriers for transducing
- 3/42 • • • • with provision for adaptation or interchange of heads
- 3/44 • Styli, e.g. sapphire, diamond
- 3/46 • • Constructions or forms, e.g. attachment of point to shank
- 3/48 • • • Needles
- 3/50 • • Anvils or other supports opposing stylus forces
- 3/52 • • Arrangements permitting styli to yield under excessive pressure
- 3/54 • • Storing; Manipulating, e.g. feeding styli to and from heads
- 3/56 • • Sharpening (by grinding B24B 19/16)
- 3/58 • Cleaning record carriers or styli, e.g. removing shavings or dust
- 3/60 • Turntables for record carriers
- 3/61 • • Damping of vibrations of record carriers on turntables [4]
- 3/64 • Re-recording, i.e. transcribing information from one grooved record carrier on to one or more similar or dissimilar record carriers
- 3/66 • Erasing information, e.g. for reuse of record carrier
- 3/68 • Record carriers
- 3/70 • • characterised by the selection of material or structure; Processes or apparatus specially adapted for manufacturing record carriers [4]
- 3/72 • • Groove formations, e.g. run-in groove, run-out groove
- 3/74 • • • Multiple output tracks, e.g. binaural stereophonic
- 3/76 • • • forming part of cinematograph films
- 3/78 • • Multiple-track arrangements

## G11B

- 3/80 • • incorporating subsidiary guide means for heads, other than modulated grooves; Part-formed unmodulated grooves for conversion into transducing grooves
- 3/90 • • with means indicating prior or unauthorised use

**5/00 Recording by magnetisation or demagnetisation of a record carrier; Reproducing by magnetic means; Record carriers therefor** (G11B 11/00 takes precedence) [4]

### Note(s)

Groups G11B 5/02-G11B 5/86 take precedence over groups G11B 5/004-G11B 5/012.

- 5/004 • Recording on, or reproducing or erasing from, magnetic drums (G11B 19/00 takes precedence) [2]
- 5/008 • Recording on, or reproducing or erasing from, magnetic tapes or wires (G11B 15/00 takes precedence) [2]
- 5/012 • Recording on, or reproducing or erasing from, magnetic discs (G11B 17/00, G11B 19/00 take precedence) [2]
- 5/016 • • using magnetic foils [2]
- 5/02 • Recording, reproducing or erasing methods; Read, write or erase circuits therefor [2]
- 5/024 • • Erasing [4]
- 5/027 • • Analogue recording [2]
- 5/03 • • • Biasing [4]
- 5/035 • • • Equalising [4]
- 5/09 • • Digital recording [2]
- 5/10 • Structure or manufacture of housings or shields for heads [4]
- 5/105 • • Mounting of head within housing [2]
- 5/11 • • Shielding of head against electric or magnetic fields [2]
- 5/115 • • • Shielding device arranged between heads or windings (G11B 5/29 takes precedence) [2]
- 5/127 • Structure or manufacture of heads, e.g. inductive [4]
- 5/133 • • with cores composed of particles, e.g. with dust cores, with ferrite cores [4]
- 5/147 • • with cores being composed of metal sheets, i.e. laminated cores [4]
- 5/153 • • • with tape-wound cores [4]
- 5/17 • • Construction or disposition of windings [4]
- 5/187 • • Structure or manufacture of the surface of the head in physical contact with, or immediately adjacent to, the recording medium; Pole pieces; Gap features (G11B 5/265, G11B 5/31 take precedence) [4]
- 5/193 • • • the pole pieces being ferrite [4]
- 5/21 • • • the pole pieces being of ferrous sheet metal [4]
- 5/23 • • • Gap features [4]
- 5/235 • • • Selection of material for gap filler [4]
- 5/245 • • • comprising means for controlling the reluctance of the magnetic circuit (G11B 5/255 takes precedence) [4]
- 5/255 • • • comprising means for protection against wear [4]
- 5/265 • • Structure or manufacture of a head with more than one gap for erasing, recording or reproducing on the same track (G11B 5/33 takes precedence) [4]
- 5/29 • • Structure or manufacture of unitary devices formed of plural heads for more than one track [4]
- 5/31 • • using thin film (G11B 5/33 takes precedence) [4]
- 5/325 • • Erasing heads using permanent magnets (general details therefor G11B 5/133-G11B 5/255) [4]

- 5/33 • • Structure or manufacture of flux-sensitive heads (general details therefor G11B 5/133-G11B 5/255) [4]
- 5/335 • • • with saturated jig, e.g. for detecting second harmonic, balanced-flux head [4]
- 5/35 • • • having vibrating elements [4]
- 5/37 • • • using galvano-magnetic devices, e.g. Hall-effect devices (G11B 5/39 takes precedence) [4]
- 5/39 • • • using magneto-resistive devices [4]
- 5/40 • Protective measures on heads, e.g. against excessive temperature (G11B 5/31 takes precedence; protection against wear G11B 5/255) [4]
- 5/41 • Cleaning of heads [2]
- 5/455 • Arrangements for functional testing of heads; Measuring arrangements for heads [4]
- 5/465 • Arrangements for demagnetisation of heads [4]
- 5/48 • Disposition or mounting of heads relative to record carriers
- 5/49 • • Fixed mountings [2]
- 5/50 • • Interchangeable mountings, e.g. for replacement of head without readjustment
- 5/52 • • with simultaneous movement of head and record carrier, e.g. rotation of head (G11B 5/588 takes precedence) [4]
- 5/53 • • • Disposition or mounting of heads on rotating support [4]
- 5/54 • • with provision for moving the head into, or out of, its operative position or across tracks [2]
- 5/55 • • • Track change, selection, or acquisition by displacement of the head [2]
- 5/56 • • with provision for moving the head for the purpose of adjusting the position of the head relative to the record carrier, e.g. manual adjustment for azimuth correction or track centering (G11B 5/54, G11B 5/58 take precedence) [2]
- 5/58 • • with provision for moving the head for the purpose of maintaining alignment of the head relative to the record carrier during transducing operation, e.g. to compensate for surface irregularities of the latter or for track following [2]
- 5/584 • • • for track following on tapes [4]
- 5/588 • • • by controlling the position of the rotating heads (by controlling the speed of the record carrier G11B 15/467; by controlling the speed of the rotating heads G11B 15/473) [4]
- 5/592 • • • • using bimorph elements supporting the heads [4]
- 5/596 • • • for track following on discs [4]
- 5/60 • • • Fluid-dynamic spacing of heads from record carriers
- 5/62 • Record carriers characterised by the selection of the material

### Note(s)

This group does not cover compositions, materials or processes, per se, which are covered by the relevant subclasses of section B or C.

- 5/627 • • of leaders for magnetic tapes, e.g. non-magnetic strips on the tapes or for connection [4]
- 5/633 • • of cinematographic films or slides with integral magnetic track [4]
- 5/64 • • comprising only the magnetic material without bonding agent

- 5/65 • • • characterised by its composition (G11B 5/66 takes precedence) [7]
- 5/66 • • • the record carriers consisting of several layers
- 5/667 • • • • including a soft magnetic layer [7]
- 5/673 • • • • comprising the repeated occurrence of two or more layers [7]
- 5/68 • • comprising one or more layers of magnetisable particles homogeneously mixed with a bonding agent
- 5/70 • • • on a base layer [1, 7]
- 5/702 • • • • characterised by the bonding agent [4]
- 5/706 • • • • characterised by the composition of the magnetic material [4]
- 5/708 • • • • characterised by the addition of non-magnetic particles to the magnetic layer [4]
- 5/71 • • • • characterised by the lubricant [4]
- 5/712 • • • • characterised by the surface treatment or coating of magnetic particles [4]
- 5/714 • • • • characterised by the dimension of the magnetic particles [4]
- 5/716 • • • • characterised by two or more magnetic layers [4]
- 5/718 • • • • • at least one on each side of the base layer [4]
- 5/72 • • Protective coatings, e.g. anti-static
- 5/725 • • • containing a lubricant [7]
- 5/73 • • Base layers [7]
- 5/733 • • • characterised by the addition of non-magnetic particles [7]
- 5/735 • • • characterised by the back layer [7]
- 5/738 • • • characterised by the intermediate layer [7]
- 5/74 • Record carriers characterised by the form, e.g. sheet shaped to wrap around a drum
- 5/76 • • Drum carriers
- 5/78 • • Tape carriers
- 5/80 • • Card carriers
- 5/82 • • Disc carriers
- 5/84 • Processes or apparatus specially adapted for manufacturing record carriers
- 5/842 • • Coating a support with a liquid magnetic dispersion [4]
- 5/845 • • • in a magnetic field [4]
- 5/848 • • Coating a support with a magnetic layer by extrusion [4]
- 5/85 • • Coating a support with a magnetic layer by vapour deposition [4]
- 5/851 • • Coating a support with a magnetic layer by sputtering [7]
- 5/852 • • Orientation in a magnetic field (G11B 5/845 takes precedence) [4]
- 5/855 • • Coating only part of a support with a magnetic layer [4]
- 5/858 • • Producing a magnetic layer by electro-plating or electroless plating [4]
- 5/86 • Re-recording, i.e. transcribing information from one magnetisable record carrier on to one or more similar or dissimilar record carriers
- 7/00 Recording or reproducing by optical means, e.g. recording using a thermal beam of optical radiation, reproducing using an optical beam at lower power; Record carriers therefor (G11B 11/00, G11B 13/00 take precedence) [4, 7]**
- 7/002 • Recording, reproducing or erasing systems characterised by the shape of the carrier [7]
- 7/0025 • • with cylinders or cylinder-like carriers, e.g. truncated cones [7]
- 7/003 • • with webs, e.g. belts, spooled tapes or films of quasi-infinite extent [7]
- 7/0033 • • with cards [7]
- 7/0037 • • with discs [7]
- 7/004 • Recording, reproducing or erasing methods; Read, write or erase circuits therefor [7]
- 7/0045 • • Recording (G11B 7/006, G11B 7/0065 take precedence) [7]
- 7/005 • • Reproducing (G11B 7/0065 takes precedence) [7]
- 7/0055 • • Erasing (G11B 7/006, G11B 7/0065 take precedence) [7]
- 7/006 • • Overwriting (G11B 7/0065 takes precedence) [7]
- 7/0065 • • Recording, reproducing or erasing by using optical interference patterns, e.g. holograms [7]
- 7/007 • Arrangement of the information on the record carrier, e.g. form of tracks [4]
- 7/013 • • for discrete information, i.e. where each information unit is stored in a distinct location [4]
- 7/08 • Disposition or mounting of heads or light sources relatively to record carriers
- 7/085 • • with provision for moving the light beam into, or out of, its operative position. [4]
- 7/09 • • with provision for moving the light beam or focus plane for the purpose of maintaining alignment of the light beam relative to the record carrier during transducing operation, e.g. to compensate for surface irregularities of the latter or for track following [4]
- 7/095 • • • specially adapted for discs, e.g. for compensation of eccentricity or wobble [4]
- 7/10 • • Interchangeable mountings, e.g. for replacement of head without readjustment
- 7/12 • Heads, e.g. forming of the optical beam spot or modulation of the optical beam (disposition or mounting of head elements within housing or with provision for moving of light source, optical beam or detector, irrelevant to the transducing method G11B 7/08) [1, 2012.01]
- 7/121 • • Protecting the head, e.g. against dust or impact with the record carrier [2012.01]
- 7/122 • • Flying-type heads, e.g. analogous to Winchester type in magnetic recording [2012.01]
- 7/123 • • Integrated head arrangements, e.g. with source and detectors mounted on the same substrate [2012.01]
- 7/124 • • • the integrated head arrangements including waveguides [2012.01]
- 7/1245 • • • • the waveguides including means for electro-optical or acousto-optical deflection [2012.01]
- 7/125 • • Optical beam sources therefor, e.g. laser control circuitry specially adapted for optical storage devices; Modulators, e.g. means for controlling the size or intensity of optical spots or optical traces [4, 2012.01]
- 7/126 • • • Circuits, methods or arrangements for laser control or stabilisation [2012.01]
- 7/1263 • • • • Power control during transducing, e.g. by monitoring [2012.01]
- 7/1267 • • • • Power calibration [2012.01]
- 7/127 • • • Lasers; Multiple laser arrays [2012.01]
- 7/1275 • • • • Two or more lasers having different wavelengths [2012.01]
- 7/128 • • • Modulators (G11B 7/1245 takes precedence) [2012.01]
- 7/13 • • Optical detectors therefor [4, 2012.01]

- 7/131 • • • Arrangement of detectors in a multiple array [2012.01]
- 7/133 • • • Shape of individual detector elements [2012.01]
- 7/135 • • Means for guiding the beam from the source to the record carrier or from the record carrier to the detector [4, 2012.01]
- 7/1353 • • • Diffractive elements, e.g. holograms or gratings [2012.01]
- 7/1356 • • • Double or multiple prisms, i.e. having two or more prisms in cooperation [2012.01]
- 7/1359 • • • Single prisms [2012.01]
- 7/1362 • • • Mirrors [2012.01]
- 7/1365 • • • Separate or integrated refractive elements, e.g. wave plates [2012.01]

#### **Note(s) [2012.01]**

In this group, integrated combinations of a refractive element, such as a coating element or phase plate, with another element, such as a lens, are classified in this group and in other appropriate groups for the other element.

- 7/1367 • • • • Stepped phase plates [2012.01]
- 7/1369 • • • • Active plates, e.g. liquid crystal panels or electrostrictive elements [2012.01]
- 7/1372 • • • Lenses [2012.01]
- 7/1374 • • • • Objective lenses [2012.01]
- 7/1376 • • • • Collimator lenses [2012.01]
- 7/1378 • • • • Separate aberration correction lenses; Cylindrical lenses to generate astigmatism; Beam expanders [2012.01]
- 7/1381 • • • Non-lens elements for altering the properties of the beam, e.g. knife edges, slits, filters or stops (G11B 7/1353-G11B 7/1369 take precedence) [2012.01]
- 7/1384 • • • Fibre optics [2012.01]
- 7/1387 • • • using the near-field effect [2012.01]
- 7/139 • • • Numerical aperture control means [2012.01]
- 7/1392 • • • Means for controlling the beam wavefront, e.g. for correction of aberration [2012.01]
- 7/1395 • • • Beam splitters or combiners (G11B 7/1353, G11B 7/1356 take precedence) [2012.01]
- 7/1398 • • • Means for shaping the cross-section of the beam, e.g. into circular or elliptical cross-section [2012.01]
- 7/14 • • specially adapted to record on, or to reproduce from, more than one track simultaneously [1, 2012.01]
- 7/22 • • Apparatus or processes for the manufacture of optical heads, e.g. assembly
- 7/24 • • Record carriers characterised by shape, structure or physical properties, or by the selection of the material (characterised by the arrangement of information on the carrier G11B 7/007) [4, 2013.01]
- 7/24003• • Shapes of record carriers other than disk shape [2013.01]
- 7/24006• • • Cylindrical or shaft-shaped [2013.01]
- 7/24009• • • Tapes, long films or long sheets [2013.01]
- 7/24012• • • Optical cards [2013.01]
- 7/24015• • Air-sandwiched disks [2013.01]
- 7/24018• • Laminated disks (G11B 7/24015 takes precedence) [2013.01]

#### **Note(s) [2013.01]**

When classifying in this group, classification is also made in group G11B 7/2403 if the subject matter disclosed in the context of a laminated disk is of more general application.

- 7/24021• • • provided with a special shape or structure for centering or eccentricity prevention, e.g. alignment [2013.01]
- 7/24024• • • Adhesion or bonding, e.g. specific adhesive layers [2013.01]
- 7/24027• • • Layers; Shape, structure or physical properties thereof (G11B 7/24021, G11B 7/24024 take precedence) [2013.01]
- 7/2403 • • Layers; Shape, structure or physical properties thereof [2013.01]
- 7/24033• • • Electrode layers [2013.01]
- 7/24035• • • Recording layers (substrates also used as recording layers G11B 7/24047) [2013.01]
- 7/24038• • • • Multiple laminated recording layers [2013.01]
- 7/24041• • • • with different recording characteristics [2013.01]
- 7/24044• • • • for storing optical interference patterns, e.g. holograms; for storing data in three dimensions, e.g. volume storage (G11B 7/24038 takes precedence) [2013.01]
- 7/24047• • • Substrates [2013.01]
- 7/2405 • • • • being also used as track layers of pre-formatted layers (tracks or pits G11B 7/2407) [2013.01]
- 7/24053• • • Protective topcoat layers lying opposite to the light entrance side, e.g. layers for preventing electrostatic charging [2013.01]
- 7/24056• • • Light transmission layers lying on the light entrance side and being thinner than the substrate, e.g. specially adapted for Blu-ray® disks [2013.01]
- 7/24059• • • specially adapted for near-field recording or reproduction [2013.01]
- 7/24062• • • Reflective layers [2013.01]
- 7/24065• • • Layers assisting in recording or reproduction below the optical diffraction limit, e.g. non-linear optical layers or structures (cover layers for near-field media G11B 7/24059) [2013.01]
- 7/24067• • • Combinations of two or more layers with specific interrelation [2013.01]
- 7/2407 • • Tracks or pits; Shape, structure or physical properties thereof (layout of tracks or pits used as the identification information G11B 7/007) [2013.01]
- 7/24073• • • Tracks [2013.01]
- 7/24076• • • • Cross sectional shape in the radial direction of a disk, e.g. asymmetrical cross sectional shape [2013.01]
- 7/24079• • • • Width or depth (G11B 7/24076 takes precedence) [2013.01]
- 7/24082• • • • Meandering [2013.01]
- 7/24085• • • • Pits [2013.01]
- 7/24088• • • • for storing more than two values, i.e. multi-valued recording for data or prepits [2013.01]
- 7/24091• • • Combinations of pits and tracks with specific interrelation [2013.01]

#### **Note(s) [2013.01]**

When classifying in this group, classification is also made in group G11B 7/2403 if the subject matter disclosed in the context of an air-sandwiched disk is of more general application.

- 7/24094 • • • • • Indication parts or information parts for identification [2013.01]
- 7/24097 • • • • • Structures for detection, control, recording operation or replay operation; Special shapes or structures for centering or eccentricity prevention (within laminated disks G11B 7/24021); Arrangements for testing, inspecting or evaluating; Containers, cartridges or cassettes [2013.01]

#### **Note(s) [2013.01]**

When classifying in this group, classification is also made in group G11B 23/00 if the subject matter disclosed in the context of an optical record carrier is of more general application.

- 7/241 • • • • • Record carriers characterised by the selection of the material [2006.01]
- 7/242 • • • • • of recording layers [2006.01]
- 7/243 • • • • • comprising inorganic materials only, e.g. ablative layers [2006.01, 2013.01]
- 7/2433 • • • • • Metals or elements of groups 13, 14, 15 or 16 of the Periodic System, e.g. B, Si, Ge, As, Sb, Bi, Se or Te [2013.01]
- 7/2437 • • • • • Non-metallic elements [2013.01]
- 7/244 • • • • • comprising organic materials only [2006.01]
- 7/245 • • • • • containing a polymeric component [2006.01]
- 7/246 • • • • • containing dyes [2006.01, 2013.01]
- 7/2463 • • • • • azulene [2013.01]
- 7/2467 • • • • • azo-dyes [2013.01]
- 7/247 • • • • • methine or polymethine dyes [2006.01, 2013.01]
- 7/2472 • • • • • cyanine [2013.01]
- 7/2475 • • • • • merocyanine [2013.01]
- 7/2478 • • • • • oxonol [2013.01]
- 7/248 • • • • • porphines; azaporphines, e.g. phthalocyanines [2006.01]
- 7/249 • • • • • containing organometallic compounds (G11B 7/246 takes precedence) [2006.01, 2013.01]
- 7/2492 • • • • • neutral compounds [2013.01]
- 7/2495 • • • • • as anions [2013.01]
- 7/2498 • • • • • as cations [2013.01]
- 7/25 • • • • • containing liquid crystals [2006.01]
- 7/251 • • • • • comprising inorganic materials dispersed in an organic matrix [2006.01]
- 7/252 • • • • • of layers other than recording layers [2006.01]

#### **Note(s) [2006.01]**

In group G11B 7/252, multi-aspect classification is applied, so that if subject matter is characterised by aspects covered by more than one of its subgroups, the subject matter should be classified in each of those subgroups.

- 7/253 • • • • • of substrates [2006.01, 2013.01]
- 7/2531 • • • • • comprising glass [2013.01]
- 7/2532 • • • • • comprising metals [2013.01]
- 7/2533 • • • • • comprising resins [2013.01]
- 7/2534 • • • • • polycarbonates [PC] [2013.01]
- 7/2535 • • • • • polyesters, e.g. PET, PETG or PEN [2013.01]
- 7/2536 • • • • • polystyrene [PS] [2013.01]
- 7/2537 • • • • • epoxy resins [2013.01]
- 7/2538 • • • • • polycycloolefins [PCO] [2013.01]
- 7/2539 • • • • • biodegradable polymers, e.g. cellulose [2013.01]

- 7/254 • • • • • of protective topcoat layers [2006.01, 2013.01]
- 7/2542 • • • • • consisting essentially of organic resins [2013.01]
- 7/2545 • • • • • containing inorganic fillers, e.g. particles or fibres [2013.01]
- 7/2548 • • • • • consisting essentially of inorganic materials [2013.01]
- 7/256 • • • • • of layers improving adhesion between layers [2006.01]
- 7/257 • • • • • of layers having properties involved in recording or reproduction, e.g. optical interference layers, sensitising layers or dielectric layers which are protecting the recording layers [2006.01, 2013.01]
- 7/2572 • • • • • consisting essentially of organic materials [2013.01]
- 7/2575 • • • • • resins [2013.01]
- 7/2578 • • • • • consisting essentially of inorganic materials [2013.01]
- 7/258 • • • • • of reflective layers [2006.01, 2013.01]
- 7/2585 • • • • • based on aluminium [2013.01]
- 7/259 • • • • • based on silver [2013.01]
- 7/2595 • • • • • based on gold [2013.01]
- 7/26 • • • • • Apparatus or processes specially adapted for the manufacture of record carriers
- 7/28 • • • • • Re-recording, i.e. transcribing information from one optical record carrier on to one or more similar or dissimilar record carriers using optical sensing means
- 7/30 • • • • • Rewritable carriers (G11B 7/24 takes precedence) [7]

**9/00 Recording or reproducing using a method or means not covered by one of the main groups G11B 3/00-G11B 7/00; Record carriers therefor** (G11B 11/00 takes precedence) [4]

#### **Note(s)**

Group G11B 9/12 takes precedence over groups G11B 9/02-G11B 9/10

- 9/02 • • • • • using ferroelectric record carriers; Record carriers therefor
- 9/04 • • • • • using record carriers having variable electric resistance; Record carriers therefor
- 9/06 • • • • • using record carriers having variable electrical capacitance; Record carriers therefor (G11B 9/02 takes precedence)
- 9/07 • • • • • Heads for reproducing capacitive information [4]
- 9/08 • • • • • using electrostatic charge injection; Record carriers therefor
- 9/10 • • • • • using electron beam; Record carriers therefor (G11B 9/08 takes precedence) [4]
- 9/12 • • • • • using near-field interactions; Record carriers therefor [7]
- 9/14 • • • • • using microscopic probe means [7]

**11/00 Recording on, or reproducing from, the same record carrier wherein for these two operations the methods or means are covered by different main groups of groups G11B 3/00-G11B 7/00 or by different subgroups of group G11B 9/00; Record carriers therefor**

#### **Note(s)**

Group G11B 11/24 takes precedence over groups G11B 11/03-G11B 11/16.

- 11/03 • • • • • using recording by deforming with non-mechanical means, e.g. laser, beam of particles [4]
- 11/05 • • • • • with reproducing by capacitive means [4]

- 11/06 • • with reproducing by mechanical sensing [4]
- 11/08 • using recording by electric charge or by variation of electric resistance or capacitance
- 11/10 • using recording by magnetisation or demagnetisation [4]
- 11/105 • • using a beam of light or a magnetic field for recording and a beam of light for reproducing, e.g. light-induced thermo-magnetic recording, Kerr effect reproducing [7]
- 11/11 • • using a beam other than a beam of light for recording [7]
- 11/115 • • using a beam other than a beam of light for reproducing [7]
- 11/12 • using recording by optical means (G11B 11/03 takes precedence) [4]
- 11/14 • • with reproducing by magnetic means
- 11/16 • using recording by mechanical cutting, deforming or pressing
- 11/18 • • with reproducing by optical means
- 11/20 • • with reproducing by magnetic means
- 11/22 • • with reproducing by capacitive means [4]
- 11/24 • using recording by near-field interactions [7]
- 11/26 • • using microscopic probe means [7]
- 13/00 Recording simultaneously or selectively by methods or means covered by different main groups; Record carriers therefor; Reproducing simultaneously or selectively therefrom [1, 7]**
  - Note(s)**
  - 1. This group covers arrangements in which there are at least two recordings of information involving two different methods or means or two different physical properties, at the same or different locations, on the same record carrier, the recordings being made or reproduced simultaneously or selectively.
  - 2. Where such combinations of means are used for changing only one main property, classification is only made in one of the relevant main groups G11B 3/00, G11B 5/00, G11B 7/00, G11B 9/00 or G11B 11/00.
- 13/02 • magnetically and by styli (G11B 13/08 takes precedence) [1, 7]
- 13/04 • magnetically and optically (G11B 13/08 takes precedence) [1, 7]
- 13/06 • optically and by styli (G11B 13/08 takes precedence) [1, 7]
- 13/08 • using near-field interactions or transducing means and at least one other method or means for recording or reproducing [7]
- 15/00 Driving, starting or stopping record carriers of filamentary or web form; Driving both such record carriers and heads; Guiding such record carriers or containers therefor; Control thereof; Control of operating function (driving or guiding heads G11B 3/00-G11B 7/00, G11B 21/00) [2]**
- 15/02 • Control of operating function, e.g. switching from recording to reproducing
- 15/03 • • by using counters [4]
- 15/04 • • Preventing, inhibiting, or warning against accidental erasing or double recording (G11B 15/05 takes precedence) [4]
- 15/05 • • by sensing features present on, or derived from, record carrier or container (G11B 15/16 takes precedence) [4]
- 15/06 • • • by sensing auxiliary features on record carriers or containers, e.g. to stop machine near the end of a tape
- 15/07 • • • • on containers [4]
- 15/08 • • • • by photoelectric sensing (G11B 15/07 takes precedence) [4]
- 15/087 • • • by sensing recorded signals [4]
- 15/093 • • • by sensing driving condition of record carrier, e.g. travel, tape tension [4]
- 15/10 • • Manually-operated control; Solenoid-operated control
- 15/12 • • Masking of heads; Selecting or switching of heads between operative and inoperative functions; Masking of beams, e.g. of light beams
- 15/14 • • • Masking or switching periodically, e.g. of rotating heads
- 15/16 • • by sensing presence, absence or position of record carrier or container
- 15/17 • • • of container [4]
- 15/18 • Driving; Starting; Stopping; Arrangements for control or regulation thereof
- 15/20 • • Moving record carrier backwards or forwards by finite amounts, i.e. back-spacing, forward-spacing
- 15/22 • • Stopping means (slowing-down preparatory to stopping by means which are different from the stopping means G11B 15/48; slowing-down preparatory to stopping by a mechanical linkage which is different from the stopping means G11B 15/50)
- 15/24 • • Drive-disengaging means
- 15/26 • • Driving record carriers by members acting directly or indirectly thereon
- 15/28 • • • through rollers driving by frictional contact with the record 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
- 15/29 • • • • through pinch-rollers (G11B 15/295 takes precedence) [4]
- 15/295 • • • • with single capstan or drum simultaneously driving the record carrier at two separate points of an isolated part thereof, e.g. the capstan acting directly on the tape rollers [4]
- 15/30 • • • through the means for supporting the record carrier, e.g. mandrel, turntable
- 15/32 • • • through the reels or cores on to which the record carrier is wound
- 15/34 • • • through non-slip drive means, e.g. sprocket
- 15/38 • • Driving record carriers by pneumatic means
- 15/40 • • Driving record carriers otherwise than by electric motor
- 15/42 • • • manually
- 15/43 • • Control or regulation of mechanical tension of record carrier, e.g. tape tension
- 15/44 • • Speed-changing arrangements; Reversing arrangements; Drive-transfer means therefor
- 15/46 • • Controlling, regulating, or indicating speed
- 15/467 • • • in arrangements for recording or reproducing wherein both record carriers and heads are driven [4]
- 15/473 • • • • by controlling the speed of the heads [4]
- 15/48 • • • Starting; Accelerating; Decelerating; Arrangements preventing malfunction during drive change
- 15/50 • • • by mechanical linkage, e.g. clutch

- 15/52 • • • by using signals recorded on, or derived from, record carrier
- 15/54 • • • by stroboscope; by tachometer
- 15/56 • the record carrier having reserve loop, e.g. to minimise inertia during acceleration
- 15/58 • • with vacuum column
- 15/60 • Guiding record carriers (guiding devices structurally associated with magazines or cassettes G11B 23/04) [4]
- 15/61 • • on drum, e.g. on drum containing rotating heads [4]
- 15/62 • • Maintaining desired spacing between record carrier and head
- 15/64 • • • by fluid-dynamic spacing
- 15/66 • • Threading; Loading; Automatic self-loading
- 15/665 • • • by extracting loop of record carrier from container [4]
- 15/67 • • • by extracting end of record carrier from container or spool [4]
- 15/675 • Guiding containers [4]
- 15/68 • • Automatic cassette-changing arrangements [2]
- 15/70 • the record carrier being an endless-loop record-carrier [2]
  
- 17/00 Guiding record carriers not specifically of filamentary or web form, or of supports therefor (guiding cards or sheets G06K 13/00)**
- 17/02 • Details
- 17/022 • • Positioning or locking of single discs [4]
- 17/025 • • • of discs which are stationary during transducing operation [4]
- 17/028 • • • of discs rotating during transducing operation [4]
- 17/03 • • • • in containers or trays [4]
- 17/032 • • • • Positioning by moving the door or the cover [4]
- 17/035 • • • • Positioning by moving the loading station [4]
- 17/038 • • Centering or locking of a plurality of discs in a single cartridge [4]
- 17/04 • • Feeding or guiding single record carrier to or from transducing unit
- 17/041 • • • specially adapted for discs contained within cartridges [2006.01]
- 17/043 • • • • Direct insertion, i.e. without external loading means [2006.01]
- 17/044 • • • • Indirect insertion, i.e. with external loading means [2006.01]
- 17/046 • • • • • with pivoting loading means [2006.01]
- 17/047 • • • • • with sliding loading means [2006.01]
- 17/049 • • • • Insertion of discs having to be extracted from the cartridge prior to recording or reproducing [2006.01]
- 17/05 • • • specially adapted for discs not contained within cartridges [2006.01]
- 17/051 • • • • Direct insertion, i.e. without external loading means [2006.01]
- 17/053 • • • • Indirect insertion, i.e. with external loading means [2006.01]
- 17/054 • • • • • with pivoting loading means [2006.01]
- 17/056 • • • • • with sliding loading means [2006.01]
- 17/057 • • • specially adapted for handling both discs contained within cartridges and discs not contained within cartridges [2006.01]
- 17/08 • from consecutive-access magazine of disc records
  
- 17/10 • • with horizontal transfer to the turntable from a stack arranged with a vertical axis
- 17/12 • • with axial transfer to the turntable from a stack with a vertical axis
- 17/14 • • • by mechanism in rotating centre post, e.g. permitting the playing of both sides of a record
- 17/16 • • • by mechanism in stationary centre post, e.g. with stepped post, using fingers on post
- 17/18 • • • by mechanism operating on the edge of the disc record
- 17/20 • • with transfer away from stack on turntable after playing
- 17/22 • from random-access magazine of disc records
  
- Note(s)**
- Group G11B 17/30 takes precedence over groups G11B 17/24-G11B 17/28.
- 17/24 • • the magazine having a toroidal or part-toroidal shape
- 17/26 • • the magazine having a cylindrical shape with vertical axis
- 17/28 • • the magazine having a cylindrical shape with horizontal axis
- 17/30 • • wherein the playing unit is moved accordingly to the location of the selected record
- 17/32 • Maintaining desired spacing between record carrier and head, e.g. by fluid-dynamic spacing [2]
- 17/34 • Guiding record carriers during transducing operation, e.g. for track following (G11B 17/32 takes precedence) [4]
  
- 19/00 Driving, starting, stopping record carriers not specifically of filamentary or web form, or of supports therefor; Control thereof; Control of operating function**
- 19/02 • Control of operating function, e.g. switching from recording to reproducing [4]
- 19/04 • • Arrangements for preventing, inhibiting, or warning against, double recording on the same blank, or against other recording or reproducing malfunctions
- 19/06 • • by counting or timing of machine operations
- 19/08 • • by using devices external to the driving mechanisms, e.g. coin-freed switch (coin actuated mechanisms G07F 5/00) [4]
- 19/10 • • by sensing presence or absence of record in accessible stored position or on turntable
- 19/12 • • by sensing distinguishing features of records, e.g. diameter
- 19/14 • • by sensing movement or position of head, e.g. means moving in correspondence with head movements
- 19/16 • • Manual control
- 19/18 • • • Manual action on one element producing control effect indirectly by consequent action of driving mechanism
- 19/20 • Driving; Starting; Stopping; Control thereof [4]
- 19/22 • • Brakes other than speed-regulating brakes
- 19/24 • • Arrangements for providing constant relative speed between record carrier and head
- 19/247 • • • using electrical means [4]
- 19/253 • • • using mechanical means [4]
- 19/26 • • Speed-changing arrangements; Reversing arrangements; Drive-transfer means therefor [4]
- 19/265 • • • Friction wheel drive [4]
- 19/27 • • • Belt drive [4]
- 19/275 • • • Gear wheel drive [4]

- 19/28 • • Speed controlling, regulating or indicating (G11B 19/24 takes precedence)
- 20/00 Signal processing not specific to the method of recording or reproducing; Circuits therefor [4]**
  - 20/02 • Analogue recording or reproducing [4]
  - 20/04 • • Direct recording or reproducing [4]
  - 20/06 • • Angle-modulation recording or reproducing [4]
  - 20/08 • • Pulse-modulation recording or reproducing (pulse-code-modulation recording G11B 20/10) [4]
  - 20/10 • Digital recording or reproducing [4]
  - 20/12 • • Formatting, e.g. arrangement of data block or words on the record carriers [4]
  - 20/14 • • using self-clocking codes [4]
  - 20/16 • • using non self-clocking codes, i.e. the clock signals being either recorded in a separate clocking track or in a combination of several information tracks [4]
  - 20/18 • • Error detection or correction; Testing [4]
  - 20/20 • for correction of skew for multitrack recording [4]
  - 20/22 • for reducing distortions [4]
  - 20/24 • for reducing noise [4]
- 21/00 Head arrangements not specific to the method of recording or reproducing**
  - 21/02 • Driving or moving of heads
  - 21/03 • • for correcting time base error [4]
  - 21/04 • • Automatic feed mechanism producing a transducing traverse of the head in a direction which cuts across the direction of travel of the recording medium, e.g. helical scan
  - 21/06 • • • the record carrier having means to ensure traverse movement of the head
  - 21/08 • • Track changing or selecting (G11B 21/12 takes precedence)
  - 21/10 • • Track finding or aligning by moving the head
  - 21/12 • • Raising and lowering; Back-spacing or forward-spacing along track; Returning to starting position
  - 21/14 • • • manually
  - 21/16 • Supporting the heads; Supporting the sockets for plug-in heads
  - 21/18 • • while the head is moving
  - 21/20 • • while the head is in operative position but stationary or permitting minor movements to follow irregularities in surface of record carrier
  - 21/21 • • • with provision for maintaining desired spacing of head from record carrier, e.g. fluid-dynamic spacing, slider [4]
  - 21/22 • • while the head is out of operative position
  - 21/24 • • Head support adjustments
  - 21/26 • • Means for interchange or replacement of head or head element
- 23/00 Record carriers not specific to the method of recording or reproducing; Accessories, e.g. containers, specially adapted for co-operation with the recording or reproducing apparatus [4]**

Note(s)

In group G11B 23/00, recording or reproducing apparatus does not include the record carriers.

  - 23/02 • Containers; Storing means (cabinets, cases, stands, modified to store record carriers G11B 33/04) [4]
  - 23/023 • • Containers for magazines or cassettes [4]
  - 23/027 • • Containers for single reels or spools [4]
  - 23/03 • • Containers for flat record carriers [4]
  - 23/033 • • • for flexible discs [4]
- 23/037 • • Single reels or spools [4]
- 23/04 • • Magazines; Cassettes (G11B 23/12 takes precedence)
- 23/06 • • • for housing endless webs or filaments
- 23/07 • • • • using a single reel or core [4]
- 23/08 • • • for housing webs or filaments having two distinct ends
- 23/087 • • • • using two different reels or cores [4]
- 23/093 • • • • the reels or cores being coaxial [4]
- 23/107 • • • • using one reel or core, one end of the record carrier coming out of the magazine or cassette [4]
- 23/113 • • Apparatus or processes specially adapted for the manufacture of magazines or cassettes [4]
- 23/12 • • Bins for random storage of webs or filaments
- 23/14 • providing ability to repeat location, e.g. using sprocket holes
- 23/16 • Record carriers with single track for recording at spaced intervals along the track thereof, e.g. for speech or language training
- 23/18 • Record carriers with multiple tracks, e.g. with complementary and partial tracks such as paired "stereo" tracks
- 23/20 • with provision for splicing to provide permanent or temporary connections
- 23/22 • • of endless belts; of tapes forming Möbius loops
- 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
- 23/26 • • of leaders for loading or threading, e.g. to form a temporary connection
- 23/28 • indicating prior or unauthorised use
- 23/30 • with provision for auxiliary signals
- 23/32 • • Electrical or mechanical contacting means; Tape stop foils
- 23/34 • • Signal means additional to the main recording track, e.g. photoelectric sensing of sprocket holes for timing
- 23/36 • • Signals on record carriers or on containers and recorded by the same method as the main recording
- 23/38 • Visual features other than those contained in record tracks or represented by sprocket holes
- 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 or photograph
- 23/42 • • Marks for indexing, speed-controlling, synchronising, or timing
- 23/44 • • Information for display simultaneously with playback of the record, e.g. photographic matter (associated working of cameras or projectors with sound-recording or -reproducing means G03B 31/00) [4]
- 23/50 • Reconditioning of record carriers; Cleaning of record carriers (G11B 3/58 takes precedence) [2]
- 25/00 Apparatus characterised by the shape of record carrier employed but not specific to the method of recording or reproducing [4]**
  - 25/02 • using cylindrical record carriers
  - 25/04 • using flat record carriers, e.g. disc, card
  - 25/06 • using web-form record carriers, e.g. tape
  - 25/08 • using filamentary record carriers, e.g. wire

25/10	• Apparatus capable of using record carriers defined in more than one of the groups G11B 25/02-G11B 25/08	27/17	• • • • using electrical sensing means [4]
		27/19	• • by using information detectable on the record carrier [4]
<b>27/00</b>	<b>Editing; Indexing; Addressing; Timing or synchronising; Monitoring; Measuring tape travel [2, 4]</b>	27/22	• • • Means responsive to presence or absence of recorded information signals
27/02	• Editing, e.g. varying the order of information signals recorded on, or reproduced from, record carriers [5]	27/24	• • • by sensing features on the record carrier other than the transducing track
27/022	• • Electronic editing of analogue information signals, e.g. audio or video signals [5]	27/26	• • • • by photoelectric detection, e.g. of sprocket holes
27/024	• • • on tapes (G11B 27/028, G11B 27/029 take precedence) [5]	27/28	• • • by using information signals recorded by the same method as the main recording
27/026	• • • on discs (G11B 27/028, G11B 27/029 take precedence) [5]	27/30	• • • on the same track as the main recording
27/028	• • • with computer assistance [5]	27/32	• • • on separate auxiliary tracks of the same or an auxiliary record carrier
27/029	• • • Insert-editing [5]	27/34	• • Indicating arrangements
27/031	• • Electronic editing of digitised analogue information signals, e.g. audio or video signals [5]	27/36	• Monitoring, i.e. supervising the progress of recording or reproducing
27/032	• • • on tapes (G11B 27/036, G11B 27/038 take precedence) [5]	<b>31/00</b>	<b>Arrangements for the associated working of recording or reproducing apparatus with related apparatus (with cameras or projectors G03B 31/00) [1, 7]</b>
27/034	• • • on discs (G11B 27/036, G11B 27/038 take precedence) [5]	31/02	• with automatic musical instruments
27/036	• • • Insert-editing [5]	<b>33/00</b>	<b>Constructional parts, details or accessories not provided for in the other groups of this subclass [4]</b>
27/038	• • • Cross-faders therefor [5]	33/02	• Cabinets; Cases; Stands; Disposition of apparatus therein or thereon [4]
27/04	• • using differential drive of record carrier and head	33/04	• • modified to store record carriers [4]
27/06	• • Cutting and rejoining; Notching, or perforating record carriers otherwise than by recording styli (record carriers with provision for splicing G11B 23/20)	33/06	• • combined with other apparatus having a different main function [4]
27/10	• Indexing; Addressing; Timing or synchronising; Measuring tape travel [2]	33/08	• • Insulation or absorption of undesired vibrations or sounds [4]
27/11	• • by using information not detectable on the record carrier [4]	33/10	• Indicating arrangements; Warning arrangements [4]
27/13	• • • the information being derived from movement of the record carrier, e.g. using tachometer [4]	33/12	• Disposition of constructional parts in the apparatus, e.g. of power supply, of modules [4]
27/15	• • • • using mechanical sensing means [4]	33/14	• Reducing influence of physical parameters, e.g. temperature change, moisture, dust [4]
<b>G11C</b>	<b>STATIC STORES (information storage based on relative movement between record carrier and transducer G11B; semiconductor devices for storage H01L, e.g. H01L 27/108-H01L 27/115; pulse technique in general H03K, e.g. electronic switches H03K 17/00)</b>		

### Note(s)

- This subclass covers devices or arrangements for storage of digital or analogue information:
  - in which no relative movement takes place between an information storage element and a transducer;
  - which incorporate a selecting-device for writing-in or reading-out the information into or from the store.
- This subclass does not cover elements not adapted for storage and not provided with such means as referred to in Note (3) below, which elements are classified in the appropriate subclass, e.g. of H01, H03K.
- In this subclass, the following terms are used with the meaning indicated:
  - "storage element" is an element which can hold at least one item of information and is provided with means for writing-in or reading-out this information;
  - "memory" is a device, including storage elements, which can hold information to be extracted when desired.

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WRITING OR READING INFORMATION.....	7/00
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**5/00 Details of stores covered by group G11C 11/00**

- 5/02 • Disposition of storage elements, e.g. in the form of a matrix array
- 5/04 • • Supports for storage elements; Mounting or fixing of storage elements on such supports
- 5/05 • • • Supporting of cores in matrix [2]
- 5/06 • Arrangements for interconnecting storage elements electrically, e.g. by wiring
- 5/08 • • for interconnecting magnetic elements, e.g. toroidal cores
- 5/10 • • for interconnecting capacitors
- 5/12 • Apparatus or processes for interconnecting storage elements, e.g. for threading magnetic cores
- 5/14 • Power supply arrangements (auxiliary circuits for stores using semiconductor devices G11C 11/4063, G11C 11/413, G11C 11/4193; in general G05F, H02J, H02M) [5, 7]

**7/00 Arrangements for writing information into, or reading information out from, a digital store**  
(G11C 5/00 takes precedence; auxiliary circuits for stores using semiconductor devices G11C 11/4063, G11C 11/413, G11C 11/4193) [2, 5]

- 7/02 • with means for avoiding parasitic signals
- 7/04 • with means for avoiding disturbances due to temperature effects
- 7/06 • Sense amplifiers; Associated circuits (amplifiers per se H03F, H03K) [1, 7]
- 7/08 • • Control thereof [7]
- 7/10 • Input/output (I/O) data interface arrangements, e.g. I/O data control circuits, I/O data buffers (level conversion circuits in general H03K 19/0175) [7]
- 7/12 • Bit line control circuits, e.g. drivers, boosters, pull-up circuits, pull-down circuits, precharging circuits, equalising circuits, for bit lines [7]
- 7/14 • Dummy cell management; Sense reference voltage generators [7]
- 7/16 • Storage of analogue signals in digital stores using an arrangement comprising analogue/digital (A/D) converters, digital memories and digital/analogue (D/A) converters [7]
- 7/18 • Bit line organisation; Bit line lay-out [7]
- 7/20 • Memory cell initialisation circuits, e.g. when powering up or down, memory clear, latent image memory [7]
- 7/22 • Read-write (R-W) timing or clocking circuits; Read-write (R-W) control signal generators or management [7]
- 7/24 • Memory cell safety or protection circuits, e.g. arrangements for preventing inadvertent reading or writing; Status cells; Test cells [7]

**8/00 Arrangements for selecting an address in a digital store**  
(auxiliary circuits for stores using semiconductor devices G11C 11/4063, G11C 11/413, G11C 11/4193) [2, 5]

- 8/02 • using selecting matrix [2]

- 8/04 • using a sequential addressing device, e.g. shift register, counter (using first in first out (FIFO) registers for changing speed of digital data flow G06F 5/06; using last in first out (LIFO) registers for processing digital data by operating upon their order G06F 7/00) [5]
- 8/06 • Address interface arrangements, e.g. address buffers (level conversion circuits in general H03K 19/0175) [7]
- 8/08 • Word line control circuits, e.g. drivers, boosters, pull-up circuits, pull-down circuits, precharging circuits, for word lines [7]
- 8/10 • Decoders [7]
- 8/12 • Group selection circuits, e.g. for memory block selection, chip selection, array selection [7]
- 8/14 • Word line organisation; Word line lay-out [7]
- 8/16 • Multiple access memory array, e.g. addressing one storage element via at least two independent addressing line groups [7]
- 8/18 • Address timing or clocking circuits; Address control signal generation or management, e.g. for row address strobe (RAS) or column address strobe (CAS) signals [7]
- 8/20 • Address safety or protection circuits, i.e. arrangements for preventing unauthorized or accidental access [7]

**11/00 Digital stores characterised by the use of particular electric or magnetic storage elements; Storage elements therefor**  
(G11C 14/00-G11C 21/00 take precedence) [5]**Note(s)**

Group G11C 11/56 takes precedence over groups G11C 11/02-G11C 11/54.

- 11/02 • using magnetic elements
- 11/04 • • using storage elements having cylindrical form, e.g. rod, wire (G11C 11/12, G11C 11/14 take precedence) [2]
- 11/06 • • using single-aperture storage elements, e.g. ring core; using multi-aperture plates in which each individual aperture forms a storage element
- 11/061 • • • using elements with single aperture or magnetic loop for storage, one element per bit, and for destructive read-out [2]
- 11/063 • • • bit-organized, such as, 2L/2D-, 3D-organization, i.e. for selection of an element by means of at least two coincident partial currents both for reading and for writing [2]
- 11/065 • • • word-organized, such as 2D-organization, or linear selection, i.e. for selection of all the elements of a word by means of a single full current for reading [2]
- 11/067 • • • using elements with single aperture or magnetic loop for storage, one element per bit, and for non-destructive read-out [2]

- 11/08 • • using multi-aperture storage elements, e.g. using transfluxors; using plates incorporating several individual multi-aperture storage elements (G11C 11/10 takes precedence; using multi-aperture plates in which each individual aperture forms a storage element G11C 11/06) [2]
- 11/10 • • using multi-axial storage elements
- 11/12 • • using tensors; using twistors, i.e. elements in which one axis of magnetisation is twisted
- 11/14 • • using thin-film elements
- 11/15 • • • using multiple magnetic layers (G11C 11/155 takes precedence) [2]
- 11/155 • • • with cylindrical configuration [2]
- 11/16 • • using elements in which the storage effect is based on magnetic spin effect
- 11/18 • using Hall-effect devices
- 11/19 • using non-linear reactive devices in resonant circuits [2]
- 11/20 • • using parametrons [2]
- 11/21 • using electric elements [2]
- 11/22 • • using ferroelectric elements [2]
- 11/23 • • using electrostatic storage on a common layer, e.g. Forrester-Haeff tubes (G11C 11/22 takes precedence) [2]
- 11/24 • • using capacitors (G11C 11/22 takes precedence; using a combination of semiconductor devices and capacitors G11C 11/34, e.g. G11C 11/40) [2, 5]
- 11/26 • • using discharge tubes [2]
- 11/28 • • • using gas-filled tubes [2]
- 11/30 • • • using vacuum tubes (G11C 11/23 takes precedence) [2]
- 11/34 • • using semiconductor devices [2]
- 11/35 • • • with charge storage in a depletion layer, e.g. charge coupled devices [7]
- 11/36 • • • using diodes, e.g. as threshold elements [2]
- 11/38 • • • • using tunnel diodes [2]
- 11/39 • • • using thyristors [5]
- 11/40 • • • using transistors [2]
- 11/401 • • • • forming cells needing refreshing or charge regeneration, i.e. dynamic cells [5]
- 11/402 • • • • with charge regeneration individual to each memory cell, i.e. internal refresh [5]
- 11/403 • • • • with charge regeneration common to a multiplicity of memory cells, i.e. external refresh [5]
- 11/404 • • • • • with one charge-transfer gate, e.g. MOS transistor, per cell [5]
- 11/405 • • • • • with three charge-transfer gates, e.g. MOS transistors, per cell [5]
- 11/406 • • • • • Management or control of the refreshing or charge-regeneration cycles [5]
- 11/4063 • • • • • Auxiliary circuits, e.g. for addressing, decoding, driving, writing, sensing or timing [7]
- 11/4067 • • • • • for memory cells of the bipolar type [7]
- 11/407 • • • • • for memory cells of the field-effect type [5]
- 11/4072 • • • • • Circuits for initialization, powering up or down, clearing memory or presetting [7]
- 11/4074 • • • • • Power supply or voltage generation circuits, e.g. bias voltage generators, substrate voltage generators, back-up power, power control circuits [7]
- 11/4076 • • • • • Timing circuits (for regeneration management G11C 11/406) [7]
- 11/4078 • • • • • Safety or protection circuits, e.g. for preventing inadvertent or unauthorised reading or writing; Status cells; Test cells (protection of memory contents during checking or testing G11C 29/52) [7]
- 11/408 • • • • • Address circuits [5]
- 11/409 • • • • • Read-write (R-W) circuits [5]
- 11/4091 • • • • • • Sense or sense/refresh amplifiers, or associated sense circuitry, e.g. for coupled bit-line precharging, equalising or isolating [7]
- 11/4093 • • • • • • Input/output (I/O) data interface arrangements, e.g. data buffers (level conversion circuits in general H03K 19/0175) [7]
- 11/4094 • • • • • • Bit-line management or control circuits [7]
- 11/4096 • • • • • • Input/output (I/O) data management or control circuits, e.g. reading or writing circuits, I/O drivers, bit-line switches [7]
- 11/4097 • • • • • • Bit-line organisation, e.g. bit-line layout, folded bit lines [7]
- 11/4099 • • • • • • Dummy cell treatment; Reference voltage generators [7]
- 11/41 • • • • forming cells with positive feedback, i.e. cells not needing refreshing or charge regeneration, e.g. bistable multivibrator or Schmitt trigger [5]
- 11/411 • • • • • using bipolar transistors only [5]
- 11/412 • • • • • using field-effect transistors only [5]
- 11/413 • • • • • Auxiliary circuits, e.g. for addressing, decoding, driving, writing, sensing, timing or power reduction [5]
- 11/414 • • • • • for memory cells of the bipolar type [5]
- 11/415 • • • • • • Address circuits [5]
- 11/416 • • • • • • Read-write (R-W) circuits [5]
- 11/417 • • • • • for memory cells of the field-effect type [5]
- 11/418 • • • • • • Address circuits [5]
- 11/419 • • • • • • Read-write (R-W) circuits [5]
- 11/4193 • • • • Auxiliary circuits specific to particular types of semiconductor storage devices, e.g. for addressing, driving, sensing, timing, power supply, signal propagation (G11C 11/4063, G11C 11/413 take precedence) [7]
- 11/4195 • • • • • Address circuits [7]
- 11/4197 • • • • • Read-write (R-W) circuits [7]
- 11/42 • • using opto-electronic devices, i.e. light-emitting and photoelectric devices electrically- or optically-coupled
- 11/44 • • using super-conductive elements, e.g. cryotron [2]
- 11/46 • using thermoplastic elements
- 11/48 • using displaceable coupling elements, e.g. ferromagnetic cores, to produce change between different states of mutual or self-inductance
- 11/50 • using actuation of electric contacts to store the information (mechanical stores G11C 23/00; switches providing a selected number of consecutive operations of the contacts by a single manual actuation of the operating part H01H 41/00)
- 11/52 • • using electromagnetic relays

- 11/54 • using elements simulating biological cells, e.g. neuron
- 11/56 • using storage elements with more than two stable states represented by steps, e.g. of voltage, current, phase, frequency (counting arrangements comprising multi-stable elements of this type H03K 25/00, H03K 29/00) [2]
- 13/00 Digital stores characterised by the use of storage elements not covered by groups G11C 11/00, G11C 23/00, or G11C 25/00**
- 13/02 • using elements whose operation depends upon chemical change (using electrochemical charge G11C 11/00)
- 13/04 • using optical elements
- 13/06 • • using magneto-optical elements (magneto-optics in general G02F) [2]
- 14/00 Digital stores characterised by arrangements of cells having volatile and non-volatile storage properties for back-up when the power is down [5]**
- 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 or content-addressed stores (in which information is addressed to a specific location G11C 11/00) [2]**
- 15/02 • using magnetic elements [2]
- 15/04 • using semiconductor elements [2]
- 15/06 • using cryogenic elements [2]
- 16/00 Erasable programmable read-only memories (G11C 14/00 takes precedence) [5]**
- 16/02 • electrically programmable [5]
- 16/04 • • using variable threshold transistors, e.g. FAMOS [5]
- 16/06 • • Auxiliary circuits, e.g. for writing into memory (in general G11C 7/00) [5]
- 16/08 • • • Address circuits; Decoders; Word-line control circuits [7]
- 16/10 • • • Programming or data input circuits [7]
- 16/12 • • • Programming voltage switching circuits [7]
- 16/14 • • • Circuits for erasing electrically, e.g. erase voltage switching circuits [7]
- 16/16 • • • • for erasing blocks, e.g. arrays, words, groups [7]
- 16/18 • • • • Circuits for erasing optically [7]
- 16/20 • • • • Initialising; Data preset; Chip identification [7]
- 16/22 • • • Safety or protection circuits preventing unauthorised or accidental access to memory cells [7]
- 16/24 • • • Bit-line control circuits [7]
- 16/26 • • • Sensing or reading circuits; Data output circuits [7]
- 16/28 • • • • using differential sensing or reference cells, e.g. dummy cells [7]
- 16/30 • • • Power supply circuits [7]
- 16/32 • • • Timing circuits [7]
- 16/34 • • • Determination of programming status, e.g. threshold voltage, overprogramming or underprogramming, retention [7]
- 17/00 Read-only memories programmable only once; Semi-permanent stores, e.g. manually-replaceable information cards (erasable programmable read-only memories G11C 16/00; coding, decoding or code conversion, in general H03M) [2, 5]**
- 17/02 • using magnetic or inductive elements (G11C 17/14 takes precedence) [2, 5]
- 17/04 • using capacitive elements (G11C 17/06, G11C 17/14 take precedence) [2, 5]
- 17/06 • using diode elements (G11C 17/14 takes precedence) [2, 5]
- 17/08 • using semiconductor devices, e.g. bipolar elements (G11C 17/06, G11C 17/14 take precedence) [5]
- 17/10 • • in which contents are determined during manufacturing by a predetermined arrangement of coupling elements, e.g. mask-programmable ROM [5]
- 17/12 • • • using field-effect devices [5]
- 17/14 • in which contents are determined by selectively establishing, breaking or modifying connecting links by permanently altering the state of coupling elements, e.g. PROM [5]
- 17/16 • • using electrically-fusible links [5]
- 17/18 • • Auxiliary circuits, e.g. for writing into memory (in general G11C 7/00) [5]
- 19/00 Digital stores in which the information is moved stepwise, e.g. shift registers (counting chains H03K 23/00)**
- 19/02 • using magnetic elements (G11C 19/14 takes precedence) [2]
- 19/04 • • using cores with one aperture or magnetic loop [2]
- 19/06 • • using structures with a number of apertures or magnetic loops, e.g. transfluxors [2]
- 19/08 • • using thin films in plane structure [2]
- 19/10 • • using thin films on rods; with twistors [2]
- 19/12 • using non-linear reactive devices in resonant circuits [2]
- 19/14 • using magnetic elements in combination with active elements, e.g. discharge tubes, semiconductor elements (G11C 19/34 takes precedence) [2, 7]
- 19/18 • using capacitors as main elements of the stages [2]
- 19/20 • using discharge tubes (G11C 19/14 takes precedence) [2]
- 19/28 • using semiconductor elements (G11C 19/14, G11C 19/36 take precedence) [2, 7]
- 19/30 • using opto-electronic devices, i.e. light-emitting and photoelectric devices electrically- or optically-coupled [2]
- 19/32 • using super-conductive elements [2]
- 19/34 • using storage elements with more than two stable states represented by steps, e.g. of voltage, current, phase, frequency [7]
- 19/36 • • using semiconductor elements [7]
- 19/38 • two-dimensional, e.g. horizontal and vertical shift registers [7]
- 21/00 Digital stores in which the information circulates (stepwise G11C 19/00)**
- 21/02 • using electromechanical delay lines, e.g. using a mercury tank
- 23/00 Digital stores characterised by movement of mechanical parts to effect storage, e.g. using balls; Storage elements therefor (storing by actuating contacts G11C 11/48)**

25/00	Digital stores characterised by the use of flowing media; Storage elements therefor	29/24	• • • • •	Accessing extra cells, e.g. dummy cells or redundant cells [2006.01]
27/00	Electric analogue stores, e.g. for storing instantaneous values	29/26	• • • • •	Accessing multiple arrays (G11C 29/24 takes precedence) [2006.01]
27/02	• Sample-and-hold arrangements (G11C 27/04 takes precedence; sampling electrical signals, in general H03K) [2, 4]	29/28	• • • • •	Dependent multiple arrays, e.g. multi-bit arrays [2006.01]
27/04	• Shift registers (charge coupled devices <u>per se</u> H01L 29/76) [4]	29/30	• • • • •	Accessing single arrays [2006.01]
29/00	Checking stores for correct operation; Testing stores during standby or offline operation [1, 2006.01]	29/32	• • • • •	Serial access; Scan testing [2006.01]
29/02	• Detection or location of defective auxiliary circuits, e.g. defective refresh counters [2006.01]	29/34	• • • • •	Accessing multiple bits simultaneously [2006.01]
29/04	• Detection or location of defective memory elements [2006.01]	29/36	• • • • •	Data generation devices, e.g. data inverters [2006.01]
29/06	• • Acceleration testing [2006.01]	29/38	• • • • •	Response verification devices [2006.01]
29/08	• • Functional testing, e.g. testing during refresh, power-on self testing (POST) or distributed testing [2006.01]	29/40	• • • • •	using compression techniques [2006.01]
29/10	• • • Test algorithms, e.g. memory scan (MScan) algorithms; Test patterns, e.g. checkerboard patterns [2006.01]	29/42	• • • • •	using error correcting codes (ECC) or parity check [2006.01]
29/12	• • • Built-in arrangements for testing, e.g. built-in self testing (BIST) [2006.01]	29/44	• • • • •	Indication or identification of errors, e.g. for repair [2006.01]
29/14	• • • • Implementation of control logic, e.g. test mode decoders [2006.01]	29/46	• • • • •	Test trigger logic [2006.01]
29/16	• • • • • using microprogrammed units, e.g. state machines [2006.01]	29/48	• • • • •	Arrangements in static stores specially adapted for testing by means external to the store, e.g. using direct memory access (DMA) or using auxiliary access paths (external testing equipment G11C 29/56) [2006.01]
29/18	• • • • Address generation devices; Devices for accessing memories, e.g. details of addressing circuits [2006.01]	29/50	• • • • •	Marginal testing, e.g. race, voltage or current testing [2006.01]
29/20	• • • • • using counters or linear-feedback shift registers (LFSR) [2006.01]	29/52	• • • • •	Protection of memory contents; Detection of errors in memory contents [2006.01]
29/22	• • • • • Accessing serial memories [2006.01]	29/54	• • • • •	Arrangements for designing test circuits, e.g. design for test (DFT) tools [2006.01]
		29/56	• • • • •	External testing equipment for static stores, e.g. automatic test equipment (ATE); Interfaces therefor [2006.01]
		99/00	Subject matter not provided for in other groups of this subclass [2006.01]	

## G12 INSTRUMENT DETAILS

### G12B CONSTRUCTIONAL DETAILS OF INSTRUMENTS, OR COMPARABLE DETAILS OF OTHER APPARATUS, NOT OTHERWISE PROVIDED FOR

#### Note(s)

1. This subclass covers only details which are not restricted to measuring instruments or to any other apparatus covered by a single class.
2. This subclass does not cover:
  - details covered by any other subclass in section A, F, G or H. In particular, details restricted to the measuring instruments are covered by the relevant subclasses of class G01, e.g. G01D;
  - constructional details restricted to electric apparatus, e.g. casings, screenings, which are covered by subclass H05K or the relevant subclass in section H.
3. Attention is drawn to the Notes following the title of section G, especially as regards to the definition of the term "measuring" in Note (2) following the title of class G01.

#### Subclass index

SENSITIVE ELEMENTS PRODUCING MOVEMENT OR DISPLACEMENT; DETAILS OF MOVEMENTS.....	1/00, 3/00
ADJUSTING POSITION OR ATTITUDE; COMPENSATING FOR TEMPERATURE EFFECTS.....	5/00, 7/00
HOUSING, SUPPORTING; INDICATING ELEMENTS.....	9/00, 11/00
CALIBRATING.....	13/00
COOLING; SCREENING.....	15/00, 17/00

- 1/00 Sensitive elements capable of producing movement or displacement for purposes not limited to measurement; Associated transmission mechanisms therefor**
- 1/02 • Compound strips or plates, e.g. bimetallic
- 1/04 • Hollow bodies having parts which are deformable or displaceable under pressure, e.g. Bourdon tubes or bellows
- 3/00 Details of movements not otherwise provided for [1, 7]**
- 3/02 • Caging of movements, i.e. locking of movements when not in use
- 3/04 • Suspensions
- 3/06 • Reducing effects of friction, e.g. by vibration
- 3/08 • Damping of movements, e.g. to promote rapid non-oscillatory movement to a final reading
- 3/10 • • using eddy currents
- 5/00 Adjusting position or attitude, e.g. level, of instruments or other apparatus, or of parts thereof; Compensating for the effects of tilting or acceleration, e.g. for optical apparatus**
- 7/00 Compensating for the effects of temperature** (by cooling G12B 15/00)
- 9/00 Housing or supporting of instruments or other apparatus**
- 9/02 • Casings; Housings; Cabinets
- 9/04 • • Details, e.g. cover
- 9/06 • • • Metal casings

- 9/08 • Supports; Devices for carrying
- 9/10 • • Instrument boards; Panels; Desks; Racks; Frameworks
- 11/00 Indicating elements; Illumination thereof**
- 11/02 • Scales; Dials
- 11/04 • Pointers; Setting-mechanisms therefor
- 13/00 Calibrating of instruments or apparatus**
- 15/00 Cooling**
- 15/02 • by closed-cycle fluid-circulating systems
- 15/04 • by currents of fluid, e.g. air, in open cycle
- 15/06 • by contact with heat-absorbing or radiating masses, e.g. heat-sink
- 17/00 Screening**
- Note(s)**
- This group covers:
- the protection of instruments or other apparatus from external radiation or other influences;
  - the prevention of the emission of undesirable radiation or other influences by instruments or other apparatus.
- 17/02 • from electric or magnetic fields, e.g. radio waves
- 17/04 • from ultra-violet, visible, or infra-red light
- 17/06 • from heat (G12B 17/04 takes precedence; cooling G12B 15/00)
- 17/08 • from influences producing mechanical damage, e.g. caused by blast, by external object, by person (G12B 17/02-G12B 17/06 take precedence)

# NUCLEONICS

## G21 NUCLEAR PHYSICS; NUCLEAR ENGINEERING

### G21B FUSION REACTORS (uncontrolled fusion, applications thereof G21J)

#### Subclass index

THERMONUCLEAR FUSION REACTORS.....	1/00
LOW-TEMPERATURE NUCLEAR FUSION REACTORS.....	3/00

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<b>1/00</b>	<b>Thermonuclear fusion reactors [1, 2006.01]</b>	1/19	• • Targets for producing thermonuclear fusion reactions [2006.01]
1/01	• Hybrid fission-fusion nuclear reactors [2006.01]	1/21	• • Electric power supply systems, e.g. for magnet systems [2006.01]
1/03	• with inertial plasma confinement [2006.01]	1/23	• • Optical systems, e.g. for irradiating targets, for heating plasma or for plasma diagnostics [2006.01]
1/05	• with magnetic or electric plasma confinement [2006.01]	1/25	• Maintenance, e.g. repair or remote inspection [2006.01]
1/11	• Details [2006.01]		
1/13	• • First wall; Blanket; Divertor [2006.01]		
1/15	• • Particle injectors for producing thermonuclear fusion reactions, e.g. pellet injectors [2006.01]		
1/17	• • Vacuum chambers; Vacuum systems [2006.01]	<b>3/00</b>	<b>Low-temperature nuclear fusion reactors, e.g. alleged cold fusion reactors [2006.01]</b>

### G21C NUCLEAR REACTORS (fusion reactors, hybrid fission-fusion reactors G21B; nuclear explosives G21J)

#### Subclass index

REACTORS.....	1/00
REACTOR ELEMENTS	
Fuel; moderator; cooling; containment; shielding.....	3/00, 5/00, 15/00, 13/00, 11/00
Handling fuel and other materials.....	19/00
CONTROL; MONITORING, TESTING.....	7/00, 17/00
EMERGENCY PROTECTION.....	9/00
MANUFACTURE.....	21/00
ADAPTATIONS OF REACTORS FOR EXPERIMENTATION OR IRRADIATION.....	23/00

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<b>1/00</b>	<b>Reactors</b>	1/10	• • • • moderator and coolant being different or separated
1/01	• General details not provided for in groups G21C 3/00-G21C 19/00 [3]	1/12	• • • • • moderator being solid, e.g. Magnox reactor
1/02	• Fast fission reactors, i.e. reactors not using a moderator	1/14	• • • • moderator being substantially not pressurised, e.g. swimming-pool reactor (G21C 1/22 takes precedence)
1/03	• • cooled by a coolant not essentially pressurised, e.g. pool-type reactors [5]	1/16	• • • • • moderator and coolant being different or separated, e.g. sodium-graphite reactor
1/04	• Thermal reactors	1/18	• • • • • • coolant being pressurised
1/06	• • Heterogeneous reactors, i.e. in which fuel and moderator are separated	1/20	• • • • • • • moderator being liquid, e.g. pressure-tube reactor
1/07	• • • Pebble-bed reactors; Reactors with granular fuel [5]	1/22	• • • • using liquid or gaseous fuel
1/08	• • • moderator being highly pressurised, e.g. boiling-water reactor, integral-superheat reactor, pressurised-water reactor (G21C 1/22 takes precedence)	1/24	• • Homogeneous reactors, i.e. in which fuel and moderator present an effectively homogeneous medium to the neutrons
1/09	• • • • Pressure regulating arrangements, i.e. pressurisers [5]	1/26	• • • Single-region reactors
		1/28	• • • Two-region reactors
		1/30	• Subcritical reactors

- 1/32 • Integral reactors, i.e. reactors wherein parts functionally associated with the reactor but not essential to the reaction, e.g. heat exchangers, are disposed inside the enclosure with the core (G21C 1/02-G21C 1/30 take precedence) [3]
- 3/00 Reactor fuel elements or their assemblies; Selection of substances for use as reactor fuel elements**
- 3/02 • Fuel elements
- 3/04 • • Constructional details
- 3/06 • • • Casings; Jackets
- 3/07 • • • • characterised by their material, e.g. alloys [5]
- 3/08 • • • • provided with external means to promote heat-transfer, e.g. fins, baffles, corrugations
- 3/10 • • • • End closures
- 3/12 • • • • Means forming part of the element for locating it within the reactor core; External spacers for this purpose
- 3/14 • • • • Means forming part of the element for inserting it into, or removing it from, the core; Means for coupling adjacent elements
- 3/16 • • • Details of the construction within the casing
- 3/17 • • • • Means for storage or immobilisation of gases in fuel elements [5]
- 3/18 • • • • Internal spacers or other non-active material within the casing, e.g. compensating for expansion of fuel rods or for compensating excess reactivity (interlayers G21C 3/20)
- 3/20 • • • • with coating on fuel or on inside of casing; with non-active interlayer between casing and active material
- 3/22 • • with fissile or breeder material in contact with coolant
- 3/24 • • with fissile or breeder material in fluid form within a non-active casing
- 3/26 • • with fissile or breeder material in powder form within a non-active casing
- 3/28 • • with fissile or breeder material in solid form within a non-active casing
- 3/30 • Assemblies of a number of fuel elements in the form of a rigid unit
- 3/32 • • Bundles of parallel pin-, rod-, or tube-shaped fuel elements
- 3/322 • • • Means to influence the coolant flow through or around the bundles [5]
- 3/324 • • • Coats or envelopes for the bundles [5]
- 3/326 • • • comprising fuel elements of different composition; Comprising, in addition to the fuel elements, other pin-, rod-, or tube-shaped elements, e.g. control rods, grid support rods, fertile rods, poison rods or dummy rods [5]
- 3/328 • • • • Relative disposition of the elements in the bundle lattice [5]
- 3/33 • • • Supporting or hanging of elements in the bundle (spacer grids G21C 3/34); Means forming part of the bundle for inserting it into, or removing it from, the core; Means for coupling adjacent bundles [5]
- 3/332 • • • • Supports for spacer grids [5]
- 3/334 • • • • Assembling the bundles [5]
- 3/335 • • • • Exchanging elements in irradiated bundles [5]
- 3/336 • • • • Spacer elements for fuel rods in the bundle (spacer grids G21C 3/34) [5]
- 3/338 • • • • Helicoidal spacer elements [5]
- 3/34 • • • Spacer grids
- 3/344 • • • • formed of assembled tubular elements [5]
- 3/348 • • • • formed of assembled non-intersecting strips [5]
- 3/352 • • • • formed of assembled intersecting strips [5]
- 3/356 • • • • being provided with fuel element supporting members [5]
- 3/36 • • Assemblies of plate-shaped fuel elements or coaxial tubes
- 3/38 • Fuel units consisting of a single fuel element in a supporting sleeve
- 3/40 • Structural combination of fuel element with thermoelectric element for direct production of electric energy from fission heat (structural combination of fuel element with instruments for temperature measurement G21C 17/112)
- 3/42 • Selection of substances for use as reactor fuel
- 3/44 • • Fluid or fluent reactor fuel
- 3/46 • • • Aqueous compositions
- 3/48 • • • • True or colloidal solutions of the active constituent
- 3/50 • • • • Suspensions of the active constituent; Slurries
- 3/52 • • • Liquid metal compositions
- 3/54 • • • Fused salt, oxide, or hydroxide compositions
- 3/56 • • • Gaseous compositions; Suspensions in a gaseous carrier
- 3/58 • • Solid reactor fuel
- 3/60 • • • Metallic fuel; Intermetallic dispersions
- 3/62 • • • Ceramic fuel
- 3/64 • • • • Ceramic dispersion fuel, e.g. cermet
- 5/00 Moderator or core structure; Selection of materials for use as moderator**
- 5/02 • Details
- 5/04 • • Spatial arrangements allowing for Wigner growth
- 5/06 • • Means for locating or supporting fuel elements
- 5/08 • • Means for preventing undesired asymmetric expansion of the complete structure
- 5/10 • • Means for supporting the complete structure
- 5/12 • characterised by composition, e.g. the moderator containing additional substances which ensure improved heat resistance of the moderator
- 5/14 • characterised by shape
- 5/16 • • Shape of its constituent parts
- 5/18 • characterised by the provision of more than one active zone
- 5/20 • • wherein one zone contains fissile material and another zone contains breeder material
- 5/22 • • wherein one zone is a superheating zone
- 7/00 Control of nuclear reaction**
- 7/02 • by using self-regulating properties of reactor materials (arrangements that involve temperature stability G21C 7/32)
- 7/04 • • of burnable poisons (burnable poisons in fuel rods G21C 3/326) [5]
- 7/06 • by application of neutron-absorbing material, i.e. material with absorption cross-section very much in excess of reflection cross-section
- 7/08 • • by displacement of solid control elements, e.g. control rods
- 7/10 • • • Construction of control elements
- 7/103 • • • • Control assemblies containing one or more absorbants as well as other elements, e.g. fuel or moderator elements [5]
- 7/107 • • • • Control elements adapted for pebble-bed reactors [5]

- 7/11 • • • • Deformable control elements, e.g. flexible, telescopic, articulated [5]
- 7/113 • • • • Control elements made of flat elements; Control elements having cruciform cross-section [5]
- 7/117 • • • • Clusters of control rods; Spider construction [5]
- 7/12 • • • • Means for moving control elements to desired position (dropping control rods into the reactor core in an emergency G21C 9/02)
- 7/14 • • • • Mechanical drive arrangements
- 7/16 • • • • Hydraulic or pneumatic drive arrangements
- 7/18 • • • • Means for obtaining differential movement of control elements
- 7/20 • • • • Disposition of shock-absorbing devices
- 7/22 • • • • by displacement of a fluid or fluent neutron-absorbing material
- 7/24 • • • • Selection of substances for use as neutron-absorbing material
- 7/26 • • • • by displacement of the moderator or parts thereof
- 7/27 • • • • Spectral shift control [5]
- 7/28 • • • • by displacement of the reflector or parts thereof
- 7/30 • • • • by displacement of reactor fuel or fuel elements
- 7/32 • • • • by varying flow of coolant through the core
- 7/34 • • • • by utilisation of a primary neutron source
- 7/36 • • • • Control circuits
- 9/00 Emergency protection arrangements structurally associated with the reactor** (emergency cooling arrangements G21C 15/18)
- 9/004 • • • • Pressure suppression [5]
- 9/008 • • • • by rupture-discs or -diaphragms [5]
- 9/012 • • • • by thermal accumulation or by steam condensation, e.g. ice condensers [5]
- 9/016 • • • • Core catchers [5]
- 9/02 • • • • Means for effecting very rapid reduction of the reactivity factor under fault conditions, e.g. reactor fuse
- 9/027 • • • • by fast movement of a solid, e.g. pebbles [5]
- 9/033 • • • • by an absorbent fluid [5]
- 9/04 • • • • Means for suppressing fires
- 9/06 • • • • Means for preventing accumulation of explosives gases, e.g. recombiners [5]
- 11/00 Shielding structurally associated with the reactor**
- 11/02 • • • • Biological shielding
- 11/04 • • • • on waterborne craft
- 11/06 • • • • Reflecting shields, i.e. for minimising loss of neutrons
- 11/08 • • • • Thermal shields; Thermal linings, i.e. for dissipating heat from gamma radiation which would otherwise heat an outer biological shield
- 13/00 Pressure vessels; Containment vessels; Containment in general**
- 13/02 • • • • Details
- 13/024 • • • • Supporting constructions for pressure vessels or containment vessels [5]
- 13/028 • • • • Seals, e.g. for pressure vessels or containment vessels [5]
- 13/032 • • • • Joints between tubes and vessel walls, e.g. taking into account thermal stresses [5]
- 13/036 • • • • the tube passing through the vessel wall, i.e. continuing on both sides of the wall [5]
- 13/04 • • • • Arrangements for expansion and contraction
- 13/06 • • • • Sealing-plugs
- 13/067 • • • • for tubes, e.g. standpipes; Locking devices for plugs [5]
- 13/073 • • • • Closures for reactor-vessels, e.g. rotatable [5]
- 13/08 • • • • Vessels characterised by the material; Selection of materials for pressure vessels
- 13/087 • • • • Metallic vessels [5]
- 13/093 • • • • Concrete vessels [5]
- 13/10 • • • • Means for preventing contamination in event of leakage
- 15/00 Cooling arrangements within the pressure vessel containing the core; Selection of specific coolants**
- 15/02 • • • • Arrangement or disposition of passages in which heat is transferred to the coolant, e.g. for coolant circulation through the supports of the fuel elements
- 15/04 • • • • from fissile or breeder material
- 15/06 • • • • in fuel elements
- 15/08 • • • • from moderating material
- 15/10 • • • • from reflector or thermal shield
- 15/12 • • • • from pressure vessel; from containment vessel
- 15/14 • • • • from ducts conducting a hot fluid; from ducts comprising auxiliary apparatus, e.g. pumps, cameras
- 15/16 • • • • comprising means for separating liquid and steam
- 15/18 • • • • Emergency cooling arrangements; Removing shut-down heat
- 15/20 • • • • Partitions or thermal insulation between fuel channel and moderator, e.g. in pressure tube reactors
- 15/22 • • • • Structural association of coolant tubes with headers or other pipes, e.g. in pressure tube reactors [4]
- 15/24 • • • • Promoting flow of the coolant
- 15/243 • • • • for liquids [5]
- 15/247 • • • • for liquid metals [5]
- 15/25 • • • • using jet pumps [5]
- 15/253 • • • • for gases, e.g. blowers [5]
- 15/257 • • • • using heat-pipes [5]
- 15/26 • • • • by convection, e.g. using chimneys, using divergent channels
- 15/28 • • • • Selection of specific coolants (if serving as the moderator G21C 5/12)
- 17/00 Monitoring; Testing**
- 17/003 • • • • Remote inspection of vessels, e.g. pressure vessels [5]
- 17/007 • • • • Inspection of the outer surfaces of vessels [5]
- 17/01 • • • • Inspection of the inner surfaces of vessels [5]
- 17/013 • • • • Inspection vehicles [5]
- 17/017 • • • • Inspection or maintenance of pipe-lines or tubes in nuclear installations [5]
- 17/02 • • • • Devices or arrangements for monitoring coolant or moderator
- 17/022 • • • • for monitoring liquid coolants or moderators [5]
- 17/025 • • • • for monitoring liquid metal coolants [5]
- 17/028 • • • • for monitoring gaseous coolants [5]
- 17/032 • • • • Reactor-coolant flow measuring or monitoring [5]
- 17/035 • • • • Moderator- or coolant-level detecting devices [5]
- 17/038 • • • • Boiling detection in moderator or coolant [5]
- 17/04 • • • • Detecting burst slugs
- 17/06 • • • • Devices or arrangements for monitoring or testing fuel or fuel elements outside the reactor core, e.g. for burn-up, for contamination (G21C 17/08, G21C 17/10 take precedence; detecting leaking fuel elements during reactor operation G21C 17/04)
- 17/07 • • • • Leak testing [5]

## G21C

- 17/08 • Structural combination of reactor core or moderator structure with viewing means, e.g. with television camera, periscope, window
- 17/10 • Structural combination of fuel element, control rod, reactor core, or moderator structure with sensitive instruments, e.g. for measuring radioactivity, strain
- 17/104 • • Measuring reactivity [5]
- 17/108 • • Measuring reactor flux [5]
- 17/112 • • Measuring temperature [5]
- 17/116 • • Passages or insulators, e.g. for electric cables [5]
- 17/12 • • Sensitive element forming part of control element
- 17/14 • Period meters
- 19/00 Arrangements for treating, for handling, or for facilitating the handling of, fuel or other materials which are used within the reactor, e.g. within its pressure vessel [2]**
- 19/02 • Details of handling arrangements
- 19/04 • • Means for controlling flow of coolant over objects being handled; Means for controlling flow of coolant through channel being serviced
- 19/06 • • Means for supporting or storing fuel elements or control elements [4]
- 19/07 • • • Storage racks; Storage pools [5]
- 19/08 • • Means for heating fuel elements before introduction into the core; Means for heating or cooling fuel elements after removal from the core
- 19/10 • • Lifting devices or pulling devices adapted for co-operation with fuel elements or with control elements
- 19/105 • • • with grasping or spreading coupling elements [5]
- 19/11 • • • with revolving coupling elements, e.g. socket coupling [5]
- 19/115 • • • with latching devices and ball couplings [5]
- 19/12 • • Arrangements for exerting direct hydraulic or pneumatic force on fuel element or on control element
- 19/14 • characterised by their adaptation for use with horizontal channels in the reactor core
- 19/16 • Articulated or telescopic chutes or tubes for connection to channels in the reactor core
- 19/18 • Apparatus for bringing fuel elements to the reactor charge area, e.g. from a storage place
- 19/19 • Reactor parts specifically adapted to facilitate handling, e.g. to facilitate charging or discharging of fuel elements [3]
- 19/20 • Arrangements for introducing objects into the pressure vessel; Arrangements for handling objects within the pressure vessel; Arrangements for removing objects from the pressure vessel
- 19/22 • • Arrangements for obtaining access to the interior of a pressure vessel whilst the reactor is operating
- 19/24 • • • by using an auxiliary vessel which is temporarily sealed to the pressure vessel
- 19/26 • Arrangements for removing jammed or damaged fuel elements or control elements; Arrangements for moving broken parts thereof
- 19/28 • Arrangements for introducing fluent material into the reactor core; Arrangements for removing fluent material from the reactor core
- 19/30 • • with continuous purification of circulating fluent material, e.g. by extraction of fission products
- 19/303 • • • specially adapted for gases (decontamination of gases G21F 9/02) [5]
- 19/307 • • • specially adapted for liquids (decontamination of liquids G21F 9/04) [5]
- 19/31 • • • for molten metals [5]
- 19/313 • • • • using cold traps [5]
- 19/317 • • • Recombination devices for radiolytic dissociation products [5]
- 19/32 • Apparatus for removing radioactive objects or materials from the reactor discharge area, e.g. to a storage place; Apparatus for handling radioactive objects or materials within a storage place or removing them therefrom (disposal of waste material G21F 9/00)
- 19/33 • Apparatus or processes for dismantling strings of spent fuel elements (G21C 19/34 takes precedence) [2]
- 19/34 • Apparatus or processes for dismantling nuclear fuel, e.g. before reprocessing [5]
- 19/36 • • Mechanical means only
- 19/365 • • • Removing cannings or casings from fuel [5]
- 19/37 • • • by separating into pieces both the canning or the casing and the fuel element, e.g. by cutting or shearing [5]
- 19/375 • • • Compacting devices, e.g. for fuel assemblies [5]
- 19/38 • • Chemical means only
- 19/40 • Arrangements for preventing occurrence of critical conditions, e.g. during storage
- 19/42 • Reprocessing of irradiated fuel
- 19/44 • • of irradiated solid fuel
- 19/46 • • • Aqueous processes
- 19/48 • • • Non-aqueous processes
- 19/50 • • of irradiated fluid fuel
- 21/00 Apparatus or processes specially adapted to the manufacture of reactors or parts thereof**
- 21/02 • Manufacture of fuel elements or breeder elements contained in non-active casings
- 21/04 • • by vibrational compaction or tamping
- 21/06 • • by swaging
- 21/08 • • by a slip-fit cladding process
- 21/10 • • by extrusion, drawing, or stretching
- 21/12 • • by hydrostatic or thermo-pneumatic canning
- 21/14 • • by plating in a fluid
- 21/16 • • by casting or dipping techniques
- 21/18 • Manufacture of control elements covered by group G21C 7/00
- 23/00 Adaptations of reactors to facilitate experimentation or irradiation [3]**

## G21D NUCLEAR POWER PLANT

- 1/00 Details of nuclear power plant** (control G21D 3/00)
- 1/02 • Arrangements of auxiliary equipment
- 1/04 • Pumping arrangements (by means within the reactor pressure vessel G21C 15/24)
- 3/00 Control of nuclear power plant** (control of nuclear reaction G21C 7/00)
- 3/02 • Manual control

- |  |  |
|--|--|
| <p>3/04 • Safety arrangements (emergency protection of reactor G21C 9/00)</p> <p>3/06 • • responsive to faults within the plant (in the reactor G21C 9/02)</p> <p>3/08 • Regulation of any parameters in the plant</p> <p>3/10 • • by a combination of a variable derived from neutron flux with other controlling variables, e.g. derived from temperature, cooling flow, pressure</p> <p>3/12 • • by adjustment of the reactor in response only to changes in engine demand</p> <p>3/14 • • • Varying flow of coolant</p> <p>3/16 • • • Varying reactivity</p> <p>3/18 • • by adjustment of plant external to the reactor only in response to change in reactivity</p> <p><b>5/00 Arrangements of reactor and engine in which reactor-produced heat is converted into mechanical energy</b></p> <p>5/02 • Reactor and engine structurally combined, e.g. portable</p> <p>5/04 • Reactor and engine not structurally combined</p> | <p>5/06 • • with engine working medium circulating through reactor core</p> <p>5/08 • • with engine working medium heated in a heat exchanger by the reactor coolant</p> <p>5/10 • • • Liquid working medium partially heated by reactor and vaporised by heat source external to the core, e.g. with oil heating</p> <p>5/12 • • • Liquid working medium vaporised by reactor coolant</p> <p>5/14 • • • • and also superheated by reactor coolant</p> <p>5/16 • • • • superheated by separate heat source</p> <p><b>7/00 Arrangements for direct production of electric energy from fusion or fission reactions</b> (obtaining electric energy from radioactive sources G21H 1/00)</p> <p>7/02 • using magneto-hydrodynamic generators</p> <p>7/04 • using thermoelectric elements (structural combination of fuel element with thermoelectric element G21C 3/40)</p> <p><b>9/00 Arrangements to provide heat for purposes other than conversion into power, e.g. for heating buildings</b></p> |
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**G21F PROTECTION AGAINST X-RADIATION, GAMMA RADIATION, CORPUSCULAR RADIATION OR PARTICLE BOMBARDMENT; TREATING RADIOACTIVELY CONTAMINATED MATERIAL; DECONTAMINATION ARRANGEMENTS THEREFOR** (radiation protection by pharmaceutical means A61K 8/00, A61Q 17/04; in cosmonautic vehicles B64G 1/54; combined with a reactor G21C 11/00; combined with X-ray tubes H01J 35/16; combined with X-ray apparatus H05G 1/02)

- |  |   |
|--|---|
| <p><b>1/00 Shielding characterised by the composition of the material</b></p> <p>1/02 • Selection of uniform shielding materials</p> <p>1/04 • • Concretes; Other hydraulic hardening materials</p> <p>1/06 • • Ceramics; Glasses; Refractories (cermets G21F 1/08)</p> <p>1/08 • • Metals; Alloys; Cermets, i.e. sintered mixtures of ceramics and metals</p> <p>1/10 • • Organic substances; Dispersions in organic carriers</p> <p>1/12 • Laminated shielding materials</p> <p><b>3/00 Shielding characterised by its physical form, e.g. granules, or shape of the material</b></p> <p>3/02 • Clothing</p> <p>3/025 • • Clothing completely surrounding the wearer [5]</p> <p>3/03 • • Aprons [5]</p> <p>3/035 • • Gloves (mounting means on glove boxes G21F 7/053) [5]</p> <p>3/04 • Bricks; Shields made up therefrom</p> <p><b>5/00 Transportable or portable shielded containers</b></p> <p>5/002 • Containers for fluid radioactive wastes [5]</p> <p>5/005 • Containers for solid radioactive wastes, e.g. for ultimate disposal [5]</p> <p>5/008 • • Containers for fuel elements [5]</p> <p>5/012 • • • Fuel element racks in the containers [5]</p> <p>5/015 • for storing radioactive sources, e.g. source carriers for irradiation units; Radioisotope containers [5]</p> <p>5/018 • • Syringe shields or holders (syringe shielding for applying radioactive material to the body A61M 36/08) [5]</p> <p>5/02 • with provision for restricted exposure of a radiation source within the container</p> <p>5/04 • • Means for controlling exposure, e.g. time, size of aperture (controlling exposure to X-radiation H05G 1/30)</p> | <p>5/06 • Details of, or accessories to, the containers [5]</p> <p>5/08 • • Shock-absorbers, e.g. impact buffers for containers [5]</p> <p>5/10 • • Heat-removal systems, e.g. using circulating fluid or cooling fins [5]</p> <p>5/12 • • Closures for containers; Sealing arrangements [5]</p> <p>5/14 • • Devices for handling containers or shipping-casks, e.g. transporting devices [5]</p> <p><b>7/00 Shielded cells or rooms</b></p> <p>7/005 • Shielded passages through walls; Locks; Transferring devices between rooms (between glove-boxes G21F 7/047) [5]</p> <p>7/01 • • Transferring by fluidic means [5]</p> <p>7/015 • Room atmosphere, temperature or pressure control devices [5]</p> <p>7/02 • Observation devices permitting vision but shielding the observer</p> <p>7/03 • • Windows, e.g. shielded [5]</p> <p>7/04 • Shielded glove-boxes</p> <p>7/047 • • Shielded passages; Closing or transferring means between glove-boxes [5]</p> <p>7/053 • • Glove mounting means [5]</p> <p>7/06 • Structural combination with remotely-controlled apparatus, e.g. with manipulators</p> <p><b>9/00 Treating radioactively contaminated material; Decontamination arrangements therefor [2, 5]</b></p> <p>9/02 • Treating gases [2]</p> <p>9/04 • Treating liquids [2]</p> <p>9/06 • • Processing</p> <p>9/08 • • • by evaporation; by distillation</p> <p>9/10 • • • by flocculation</p> <p>9/12 • • • by absorption; by adsorption; by ion-exchange</p> <p>9/14 • • • by incineration; by calcination, e.g. desiccation</p> <p>9/16 • • • by fixation in stable solid media</p> |
|--|---|

## G21F

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|------|---|------|-------------------------------|
| 9/18 | • • • by biological processes   | 9/28 | • Treating solids [2]         |
| 9/20 | • • Disposal of liquid waste  | 9/30 | • • Processing                |
| 9/22 | • • • by storage in a tank or other container                         | 9/32 | • • • by incineration         |
| 9/24 | • • • by storage in the ground; by storage under water, e.g. in ocean | 9/34 | • • Disposal of solid waste   |
| 9/26 | • • • by dilution in water, e.g. in ocean, in stream                  | 9/36 | • • • by packaging; by baling |

## G21G CONVERSION OF CHEMICAL ELEMENTS; RADIOACTIVE SOURCES [2]

- |             |   |             |  |
|-------------|---|-------------|--|
| <b>1/00</b> | <b>Arrangements for converting chemical elements by electromagnetic radiation, corpuscular radiation, or particle bombardment, e.g. producing radioactive isotopes</b> (by thermonuclear reactions in nuclear reactors G21B; conversion of nuclear fuel in nuclear reactors G21C) [2] | <b>4/00</b> | <b>Radioactive sources [2]</b>   |
| 1/02        | • in nuclear reactors   | 4/02        | • Neutron sources [2]  |
| 1/04        | • outside of nuclear reactors or particle accelerators [2]  | 4/04        | • Radioactive sources other than neutron sources (radioactive dressings A61M 36/14) [2]                      |
| 1/06        | • • by neutron irradiation [2]  | 4/06        | • • characterised by constructional features [2]   |
| 1/08        | • • • accompanied by nuclear fission [2]  | 4/08        | • • • specially adapted for medical applications (radiation therapy using radioactive sources A61N 5/10) [2] |
| 1/10        | • • by bombardment with electrically-charged particles (irradiation devices G21K 5/00) [2]  | 4/10        | • • with radium emanation [2]  |
| 1/12        | • • by electromagnetic irradiation, e.g. with gamma or X-rays (irradiation devices G21K 5/00) [2]   | <b>5/00</b> | <b>Alleged conversion of chemical elements by chemical reaction</b>  |
|             |   | <b>7/00</b> | <b>Conversion of chemical elements not provided for in other groups of this subclass [2009.01]</b>           |

## G21H OBTAINING ENERGY FROM RADIOACTIVE SOURCES; APPLICATIONS OF RADIATION FROM RADIOACTIVE SOURCES; UTILISING COSMIC RADIATION (fusion reactors G21B; nuclear reactors G21C)

- |             |   |             |  |
|-------------|---|-------------|--|
| <b>1/00</b> | <b>Arrangements for obtaining electrical energy from radioactive sources, e.g. from radioactive isotopes</b>  | <b>5/00</b> | <b>Applications of radiation from radioactive sources or arrangements therefor</b> (producing mutation in plants A01H 1/06; preservation of dairy products A23C 3/07; preservation of foodstuffs A23L 3/26; for therapeutic purposes A61N 5/10; in chemical, physical or physicochemical processes in general B01J 19/08; in electrostatic separation B03C 3/38; for after-treatment of coatings applied as liquids or other fluent materials B05D 3/06; for action between electric vehicles and tracked apparatus B61L 1/10, B61L 3/06; for preparation of organic chemical compounds C07, C08F 2/46; for treating macromolecular substances or articles made therefrom B29C 71/04, C08J 3/28, C08J 7/18; for cracking of hydrocarbon oils C10G 15/10, C10G 32/04; for reforming naphtha C10G 35/16; preservation or ageing of products obtained from fermentation processes C12H 1/06, C12H 1/16; for bleaching fibres D06L 3/04; measuring G01T; irradiation devices, gamma- or X-ray microscopes G21K; in discharge tubes H01J; apparatus for generating ions to be introduced into non-enclosed gases, e.g. into the atmosphere, H01T 23/00; for carrying-off electrostatic charges H05F 3/06) |
| 1/02        | • Cells charged directly by beta radiation  |             |  |
| 1/04        | • Cells using secondary emission induced by alpha radiation, beta radiation, or gamma radiation   |             |  |
| 1/06        | • Cells wherein radiation is applied to the junction of different semiconductor materials   |             |  |
| 1/08        | • Cells in which radiation ionises a gas in the presence of a junction of two dissimilar metals, i.e. contact potential-difference cells  |             |  |
| 1/10        | • Cells in which radiation heats a thermoelectric junction or a thermionic converter [2]  |             |  |
| 1/12        | • Cells using conversion of the radiation into light combined with subsequent photoelectric conversion into electric energy   |             |  |
| <b>3/00</b> | <b>Arrangements for direct conversion of radiation energy from radioactive sources into forms of energy other than electric energy, e.g. light</b>  |             |  |
| 3/02        | • in which material is excited to luminesce by the radiation (lamps in which a gas filling or screen or coating is excited to luminesce by radioactive material structurally associated with the lamp H01J 65/00) | 5/02        | • as tracers   |
|             |   | <b>7/00</b> | <b>Use of effects of cosmic radiation</b>  |

## G21J NUCLEAR EXPLOSIVES; APPLICATIONS THEREOF

### Note(s)

This subclass covers uncontrollable fission or fusion reactions.

- |             |                                  |             |   |
|-------------|----------------------------------|-------------|---|
| <b>1/00</b> | <b>Nuclear explosive devices</b> | <b>3/00</b> | <b>Peaceful applications of nuclear explosive devices</b> |
|             |                                  | 3/02        | • for excavation  |

**5/00 Detection arrangements for nuclear explosions**

**G21K TECHNIQUES FOR HANDLING PARTICLES OR IONISING RADIATION NOT OTHERWISE PROVIDED FOR; IRRADIATION DEVICES; GAMMA RAY OR X-RAY MICROSCOPES [2]**

**Note(s) [2012.01]**

In this subclass, the following term is used with the meaning indicated:

- "particle" means a molecular, atomic or subatomic particle.

**1/00 Arrangements for handling particles or ionising radiation, e.g. focusing or moderating** (ionising radiation filters G21K 3/00; production or acceleration of neutrons, electrically-charged particles, neutral molecular beams or neutral atomic beams H05H 3/00-H05H 15/00) [2]

1/02 • using diaphragms, collimators [2]

1/04 • • using variable diaphragms, shutters, choppers [2]

1/06 • using diffraction, refraction, or reflection, e.g. monochromators (G21K 1/10, G21K 7/00 take precedence) [2]

1/08 • Deviation, concentration, or focusing of the beam by electric or magnetic means (electron-optical arrangements in electric discharge tubes H01J 29/46) [2]

1/087 • • by electrical means [4]

1/093 • • by magnetic means [4]

1/10 • Scattering devices; Absorbing devices [2]

1/12 • • Resonant absorbers or driving arrangements therefor, e.g. for Mössbauer-effect devices [3]

1/14 • using charge exchange devices, e.g. for neutralising or changing the sign of the electrical charges of beams [3]

1/16 • using polarising devices, e.g. for obtaining a polarised ion beam [3]

**3/00 ionising radiation filters, e.g. X-ray filters [2]**

**4/00 Conversion screens for the conversion of the spatial distribution of particles or ionising radiation into visible images, e.g. fluoroscopic screens [3]**

**5/00 Irradiation devices** (adaptations of reactors to facilitate irradiation G21C 23/00; discharge tubes for irradiating H01J 33/00, H01J 37/00) [2]

5/02 • having no beam-forming means [2]

5/04 • with beam-forming means [2]

5/08 • Holders for targets or for objects to be irradiated [2]

5/10 • with provision for relative movement of beam source and object to be irradiated [3]

**7/00 Gamma ray or X-ray microscopes [2]**

**G99 SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION**

**G99Z SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION [2006.01]**

**Note(s) [2006.01]**

This subclass covers subject matter that:

- a. is not provided for, but is most closely related to, the subject matter covered by the subclasses of this section, and
- b. is not explicitly covered by any subclass of another section.

**99/00 Subject matter not otherwise provided for in this section [2006.01]**