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Section G

Physics

World Intellectual Property Organization

SECTION G – PHYSICS

INSTRUMENTS

NUCLEONICS

SECTION G – PHYSICS

(1) 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).

(2) 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.

(3) 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

(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". **[7]**

(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. **[6]**

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. **[6]**

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]**

(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

(1) This subclass covers measuring of position or displacement in terms of linear or angular dimensions. **[4]**

(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 to G01B 17/00 are classified in group G01B 21/00 if no single other group can be selected as being predominantly applicable.

Subclass index

1/00 Measuring instruments characterised by the selection of material therefor

3/00 Instruments as specified in the subgroups and characterised by the use of mechanical measuring means (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]**

3/02 . Rulers or tapes with scales or marks for direct reading
3/11 . Chains for measuring length
3/12 . Measuring wheels
3/14 . Templates for checking contours
3/16 . Compasses, i.e. with a pair of pivoted arms
3/18 . Micrometers
3/20 . Slide gauges
3/22 . Feeler-pin gauges, e.g. dial gauges (for measuring contours or curvatures G01B 5/20)
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
3/34 . Ring or other apertured gauges, e.g. "go/no-go" gauge
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
3/46 . Plug gauges for internal dimensions with engaging surfaces which are at a fixed distance, although they may be preadjustable
3/56 . Gauges for measuring angles or tapers, e.g. conical calipers

5/00 Measuring arrangements characterised by the use of mechanical means (instruments of the types covered by group G01B 3/00 per se G01B 3/00) **[2]**

5/004 . for measuring coordinates of points **[6]**
5/008 . . using coordinate measuring machines **[6]**
5/02 . for measuring length, width, or thickness (G01B 5/004, G01B 5/08 take precedence) **[6]**
5/08 . for measuring diameters
5/14 . for measuring distance or clearance between spaced objects or spaced apertures (G01B 5/24 takes precedence)
5/18 . for measuring depth
5/20 . for measuring contours or curvatures
5/24 . for measuring angles or tapers; for testing the alignment of axes
5/26 . for measuring areas, e.g. planimeter (integrators in general G06G)
5/28 . for measuring roughness or irregularity of surfaces
5/30 . for measuring the deformation in a solid, e.g. mechanical strain gauge

7/00 Measuring arrangements characterised by the use of electric or magnetic means

7/004 . for measuring coordinates of points **[6]**
7/008 . . using coordinate measuring machines **[6]**
7/02 . for measuring length, width, or thickness (G01B 7/004, G01B 7/12 takes precedence) **[6]**
7/12 . for measuring diameters
7/14 . for measuring distance or clearance between spaced objects or spaced apertures (G01B 7/30 takes precedence)
7/16 . for measuring the deformation in a solid, e.g. by resistance strain gauge
7/26 . for measuring depth
7/28 . for measuring contours or curvatures
7/30 . for measuring angles or tapers; for testing the alignment of axes
7/305 . . for testing perpendicularity **[6]**
7/31 . . for testing the alignment of axes
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]**
9/04 . 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
11/14 . 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
11/26 . 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

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

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]**

21/06 . . specially adapted for measuring length or width of objects while moving **[3]**
21/08 . . for measuring thickness **[3]**
21/10 . for measuring diameters **[3]**
21/16 . 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]**
21/28 . 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)

(1) 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.
(2) Attention is drawn to the Notes following the title of class G01.

Subclass index

1/00 **Measuring angles**

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 17/00) **[1,8]**
3/02 . Details
3/06 . . Use of electric means to obtain final indication
3/08 . . . Use of electric radiation detectors

5/00 **Measuring height**; **Measuring distances transverse to line of sight**; **Levelling between separated points**; **Surveyors' levels** (G01C 3/00 takes precedence)

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

9/00 **Measuring inclination, e.g. by clinometers, by levels**
9/18 . by using liquids

11/00 **Photogrammetry or videogrammetry, e.g. stereogrammetry**; **Photographic surveying [1,8]**

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 to G01C 13/00**
15/02 . Means for marking measuring points
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)

19/00 **Gyroscopes**; **Turn-sensitive devices with vibrating masses**; **Turn-sensitive devices without moving masses**
19/56 . Turn-sensitive devices with vibrating masses, e.g. tuning fork
19/58 . Turn-sensitive devices without moving masses **[3]**
19/64 . . Gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams **[3]**
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 to 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]**
21/10 . by using measurement of speed or acceleration (G01C 21/24, G01C 21/26 take precedence) **[1,7]**
21/20 . Instruments for performing navigational calculations (G01C 21/24, G01C 21/26 take precedence) **[1,7]**
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]**

21/34 . . Route searching; Route guidance **[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

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 17/00)

G01D MEASURING NOT SPECIALLY ADAPTED FOR A SPECIFIC VARIABLE; **ARRANGEMENTS FOR MEASURING TWO OR MORE VARIABLES NOT COVERED BY A SINGLE OTHER SUBCLASS**; **TARIFF METERING APPARATUS**; **MEASURING OR TESTING NOT OTHERWISE PROVIDED FOR** (means structurally associated with lightning or other overvoltage discharging apparatus for recording the operation thereof G01R; displaying information in general G09F; recording in a way which requires playback through a transducer G11B)

(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

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; computing G06)

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

3/028 . mitigating undesired influences, e.g. temperature, pressure **[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 (tariff meters for measuring the time integral of electric power or current G01R 11/00; in taximeters G07B 13/00; coin-freed mechanisms therefor G07F)

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; sensing members, see the relevant subclasses, e.g. of G01, H01; for converting a single current or a single voltage into a mechanical displacement G01R 5/00; specially adapted for high-voltage or high-current measuring arrangements G01R 15/00, G01R 15/14; measuring currents or voltages using digital measurement techniques G01R 19/25; transmission systems for measured values, control or similar signals G08C, e.g. electrical signals G08C 19/00) **[6]**

Note

Groups G01D 5/02 to 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
5/12 . using electric or magnetic means (G01D 5/02 takes precedence) **[3]**
5/26 . using optical means, i.e. using infra-red, visible or ultra-violet light
5/42 . using fluid means
5/48 . using wave or particle radiation means (G01D 5/26 takes precedence)
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

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

7/00 Indicating measured values
7/02 . Indicating value of two or more variables simultaneously
7/12 . Audible indication of meter readings, e.g. for the blind **[2]**

9/00 Recording measured values

11/00 Component parts of measuring arrangements not specially adapted for a specific variable (G01D 13/00, G01D 15/00 take precedence)
11/24 . Housings
11/28 . Structurally-combined illuminating devices

13/00 Component parts of indicators for measuring arrangements not specially adapted for a specific variable

15/00 Component parts of recorders for measuring arrangements not specially adapted for a specific variable
15/06 . Electric recording elements, e.g. electrolytic
15/10 . Heated recording elements acting on heat-sensitive layers
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; implements for writing or drawing in general B43K)
15/20 . Recording elements for printing with ink or for printing by deformation or perforation of the recording surface, e.g. embossing

18/00 Testing or calibrating of apparatus or arrangements provided for in groups G01D 1/00 to 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

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G01F MEASURING VOLUME, VOLUME FLOW, MASS FLOW, OR LIQUID LEVEL; **METERING BY VOLUME** (milk flow sensing devices in milking machines or devices A01J 5/007; measuring or recording blood flow A61B 5/02, A61B 8/06; metering media to the human body A61M 5/168; burettes or pipettes B01L 3/02; arrangements of liquid volume meters or volume-flow meters in liquid-delivering apparatus, e.g. for retail sale purposes, B67D 7/08; pumps, fluid motors, details common to measuring or metering devices and pumps or fluid motors F01 to F04; locating, determining distance or velocity using reflection or reradiation of radio waves, analogous arrangements using other waves G01S; systems for ratio control G05D 11/00) **[2,5]**

Note

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

Subclass index

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; measuring speed of flow G01P 5/00; indicating presence or absence of flow G01P 13/00; regulating quantity or ratio G05D) **[2]**

Note

Groups G01F 1/704 to G01F 1/76 take precedence over groups G01F 1/05 to G01F 1/68. **[2]**

1/05 . by using mechanical effects **[2]**
1/20 . . by detection of dynamic effects of the fluid flow **[2]**
1/32 . . . by swirl flowmeter, e.g. using Karman vortices **[2]**
1/34 . . by measuring pressure or differential pressure **[2]**
1/56 . by using electric or magnetic effects (G01F 1/66 takes precedence) **[2]**
1/66 . by measuring frequency, phase shift, or propagation time of electromagnetic or other waves, e.g. ultrasonic flowmeters **[2]**
1/68 . by using thermal effects **[2]**
1/684 . . Structural arrangements; Mounting of elements, e.g. in relation to fluid flow **[6]**
1/696 . . Circuits therefor, e.g. constant-current flow meters **[6]**
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]**
1/72 . Devices for measuring pulsing fluid flows **[2]**
1/74 . Devices for measuring flow of a fluid or flow of a fluent solid material in suspension in another fluid **[2]**
1/76 . Devices for measuring mass flow of a fluid or a fluent solid material (weighing a continuous stream of material during flow G01G 11/00) **[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

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

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
11/10 . with measuring chambers moved during operation

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

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15/00 Details of, or accessories for, apparatus of groups G01F 1/00 to G01F 13/00 insofar as such details or appliances are not adapted to particular types of such apparatus
15/06 . Indicating or recording devices, e.g. for remote indication

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]

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 (in wells E21B 47/04; adaptation to, or mounting on, steam boilers F22B 37/00; level regulation G05D; alarm devices G08B)
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
23/14 . by measurement of pressure (measuring pressure in general G01L)
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
23/28 . . 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]**
23/296 . . . Acoustic waves **[6]**
23/30 . by floats (switches operated by floats H01H 35/18) **[4]**

25/00 Testing or calibrating of apparatus for measuring volume, volume flow, or liquid level, or for metering by volume

G01G WEIGHING (sorting by weighing B07C 5/00)

Note

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

Subclass index

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

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

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

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 to G01G 5/00

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

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

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 17/00; apportioning by weight materials to be mixed G01G 19/00; combinatorial weighing G01G 19/387) **[5]**

15/00 Arrangements for check-weighing of materials dispensed into removable containers (packaging aspects B65B)

17/00 Apparatus for, or methods of, weighing material of special form or property (determining weight by measuring volume G01F)

19/00 Weighing apparatus or methods adapted for special purposes not provided for in groups G01G 11/00 to G01G 17/00 (incorporation of weighing devices in cranes B66C 13/00)

19/02 . for weighing wheeled or rolling bodies, e.g. vehicles

19/08 . for incorporation in vehicles (arrangements on vehicles B60P 5/00)

19/387 . for combinatorial weighing, i.e. selecting a combination of articles whose total weight or number is closest to a desired value **[5]**

19/40 . 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; computers in general G06)

19/52 . Weighing apparatus combined with other objects, e.g. with furniture (with walking-sticks A45B 3/00)

21/00 Details of weighing apparatus

23/00 Auxiliary devices for weighing apparatus

23/18 . Indicating devices, e.g. for remote indication; Recording devices; Scales, e.g. graduated

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G01H MEASUREMENT OF MECHANICAL VIBRATIONS OR ULTRASONIC, SONIC OR INFRASONIC WAVES (generation of mechanical vibrations without measurement B06B, G10K; measuring position, direction or velocity of an object G01C, G01S; measuring quasi-steady pressure of a fluid G01L 7/00; determining unbalance G01M 1/00; determining properties of material by sonic or ultrasonic waves transmitted therethrough G01N; systems using the reflection or reradiation of acoustic waves, e.g. acoustic imaging, G01S 15/00; seismology, seismic prospecting, acoustic prospecting G01V 1/00; acousto-optical devices per se G02F; obtaining records by techniques analogous to photography using ultrasonic, sonic or infrasonic waves G03B 42/00; speech analysis or synthesis, speech recognition G10L; information storage based on relative movement between record carrier and transducer G11B; piezo-electric, electrostrictive or magnetostrictive elements in general H01L; manufacture of electromechanical resonators by processes which include measurement of frequency with consequential modification of the resonator H03H 3/00) **[4]**

(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

1/00 **Measuring vibrations in solids by using direct conduction to the detector** (G01H 9/00, G01H 11/00 take precedence)

3/00 **Measuring vibrations by using a detector in a fluid** (G01H 7/00, G01H 9/00, G01H 11/00 take precedence)

5/00 **Measuring propagation velocity of ultrasonic, sonic or infrasonic waves**

7/00 **Measuring reverberation time** (measuring absorption of vibrations in a material G01N; arrangements for producing a reverberation G10K 15/08)

9/00 **Measuring mechanical vibrations or ultrasonic, sonic or infrasonic waves by using radiation-sensitive means, e.g. optical means**

11/00 **Measuring mechanical vibrations or ultrasonic, sonic or infrasonic waves by detecting changes in electric or magnetic properties**

13/00 **Measuring resonant frequency**

15/00 **Measuring mechanical or acoustic impedance [3]**

17/00 **Measuring mechanical vibrations or ultrasonic, sonic or infrasonic waves, not provided for in the other groups of this subclass [4]**

G01J MEASUREMENT OF INTENSITY, VELOCITY, SPECTRAL CONTENT, POLARISATION, PHASE OR PULSE CHARACTERISTICS OF INFRA-RED, VISIBLE OR ULTRA-VIOLET LIGHT; COLORIMETRY; RADIATION PYROMETRY (light sources F21, H01J, H01K, H05B; investigating properties of materials by optical means G01N) **[2]**

(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

1/00 **Photometry, e.g. photographic exposure meter** (spectrophotometry G01J 3/00; specially adapted for radiation pyrometry G01J 5/00)

1/02 . Details

1/04 . . Optical or mechanical part

1/06 . . . Restricting the angle of incident light

1/08 . . Arrangements of light sources specially adapted for photometry

1/10 . by comparison with reference light or electric value

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)

1/44 . . Electric circuits

1/46 . . . using a capacitor

3/00 **Spectrometry**; **Spectrophotometry**; **Monochromators**; **Measuring colours [4]**

3/12 . Generating the spectrum; Monochromators

3/28 . Investigating the spectrum (using colour filters G01J 3/51) **[4]**

3/30 . . Measuring the intensity of spectral lines directly on the spectrum itself (G01J 3/42, G01J 3/44 take precedence)

3/42 . . Absorption spectrometry; Double-beam spectrometry; Flicker spectrometry; Reflection spectrometry (beam-switching arrangements G01J 3/00) **[4]**

3/44 . . Raman spectrometry; Scattering spectrometry **[4]**

3/443 . . Emission spectrometry **[4]**

3/45 . . Interferometric spectrometry **[4]**

3/46 . Measurement of colour; Colour measuring devices, e.g. colorimeters (measuring colour temperature G01J 5/60) **[4]**

3/50 . . using electric radiation detectors **[4]**

3/51 . . . using colour filters **[4]**

4/00 **Measuring polarisation of light** (investigating or analysing materials by measuring rotation of plane of polarised light G01N 21/21) **[2]**

5/00 **Radiation pyrometry** (photometry in general G01J 1/00; spectrometry in general G01J 3/00)

5/02 . Details

5/04 . . Casings

5/06 . . Arrangements for eliminating effects of disturbing radiation

5/08 . . Optical features

5/10 . using electric radiation detectors
5/12 . . using thermoelectric elements, e.g. thermocouples (thermoelectric elements per se H01L 35/00, H01L 37/00)
5/20 . . using resistors, thermistors, or semiconductors sensitive to radiation
5/48 . using wholly visual means
5/50 . using techniques specified in the subgroups below
5/52 . . using comparison with reference sources, e.g. disappearing-filament pyrometer
5/58 . . using absorption; using polarisation; using extinction effect
5/60 . . using determination of colour temperature
5/62 . . using means for chopping the light

7/00 Measuring velocity of light

9/00 Measuring optical phase difference (devices or arrangements for controlling the phase of light beams G02F 1/01); **Determining degree of coherence**; **Measuring optical wavelength** (spectrometry G01J 3/00) **[3]**

11/00 Measuring the characteristics of individual optical pulses or of optical pulse trains [5]

G01K MEASURING TEMPERATURE; **MEASURING QUANTITY OF HEAT**; **THERMALLY-SENSITIVE ELEMENTS NOT OTHERWISE PROVIDED FOR** (sensing temperature changes for compensating measurements of other variables or for compensating readings of instruments for variations in temperature, see G01D or relevant subclass for variable measured; radiation pyrometry G01J; investigating or analysing materials by use of thermal means G01N 25/00; compound sensitive elements, e.g. bimetallic, G12B 1/00)

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

Subclass index

1/00 Details of thermometers not specially adapted for particular types of thermometer (circuits for reducing thermal inertia G01K 7/42) **[6]**

1/08 . Protective devices, e.g. casings
1/14 . Supports; Fastening devices; Mounting thermometers in particular locations

3/00 Thermometers giving results other than momentary value of temperature (G01K 7/42 takes precedence; using thermo-electric elements G01K 7/02) **[6]**

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; of vapour arising from a liquid G01K 11/00; thermally-actuated switches H01H)

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; measuring electric or magnetic variables G01R)

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 (thermo-electric or thermo-magnetic devices per se H01L 35/00, H01L 37/00)
7/16 . using resistive elements (resistive elements per se H01C, H01L)
7/30 . using thermal noise of resistances or conductors
7/32 . using change of resonant frequency of a crystal
7/34 . using capacitative elements (capacitors per se H01G)
7/36 . using magnetic elements, e.g. magnets, coils (magnetic elements per se H01F)
7/40 . using ionisation of gases
7/42 . Circuits for reducing thermal inertia; Circuits for predicting the stationary value of temperature **[6]**

9/00 Measuring temperature based on movements caused by redistribution of weight, e.g. tilting thermometer (not giving momentary value of temperature G01K 3/00)

11/00 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

13/00 Adaptations of thermometers for specific purposes

15/00 **Testing or calibrating of thermometers**

17/00 **Measuring quantity of heat** (measuring temperature by calorimetry G01K 3/00 to G01K 11/00; specially adapted for measuring thermal properties of materials, e.g. specific heat, heat of combustion, G01N)

19/00 **Testing or calibrating calorimeters**

G01L **MEASURING FORCE, STRESS, TORQUE, WORK, MECHANICAL POWER, MECHANICAL EFFICIENCY, OR FLUID PRESSURE** (methods or devices for measuring specially adapted for metal-rolling mills B21B 38/00; sensing pressure changes for compensating measurements of other variables or for compensating readings of instruments for variations in pressure, see G01D or other relevant subclasses for the variable measured; weighing G01G; converting a pattern of forces into electrical signals G06K 11/00) **[4]**

Note

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

Subclass index

1/00 **Measuring force or stress, in general** (measuring force due to impact G01L 5/00; measuring fluid pressure G01L 7/00 to G01L 27/00; measuring deformation of bodies as a result of stress by using gauges G01B) **[4]**

1/02 . by hydraulic or pneumatic means

1/04 . by measuring elastic deformation of gauges, e.g. of springs

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 1/20)

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 (resistance strain gauges for measuring linear expansion or contraction G01B)

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

1/24 . 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

3/10 . . . involving electric or magnetic means for indicating

3/12 . . . . involving photoelectric means

3/16 . Rotary-absorption dynamometers, e.g. of brake type

5/00 **Apparatus for, or methods of, measuring force, e.g. due to impact, work, mechanical power, or torque, adapted for special purposes** (measuring pressure of a fluent medium G01L 7/00 to G01L 21/00; measuring rapid changes of pressure in steam, gas, or liquid G01L 23/00)

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

5/12 . 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 (in balancing G01M)
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 (arrangements in wrenches or screwdrivers B25B 23/14)
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; measuring tyre pressure or the pressure of other inflated bodies G01L 17/00; vacuum gauges G01L 21/00; hollow bodies deformable or displaceable under internal pressure per se G12B 1/00)

7/02 . in the form of elastically-deformable gauges

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; vacuum gauges G01L 21/00)

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 . by making use of electrokinetic cells, i.e. liquid-containing cells wherein an electric potential is produced or varied upon the application of stress

11/00 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

13/00 Devices or apparatus for measuring differences of two or more fluid pressure values

15/00 Devices or apparatus for measuring two or more fluid pressure values simultaneously

17/00 Devices or apparatus for measuring tyre pressure or the pressure in other inflated bodies (specially adapted for mounting on vehicles or tyres B60C 23/00; connection of valves to inflatable elastic bodies B60C 29/00)

19/00 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

19/04 . Means for compensating for effects of changes of temperature
19/06 . Means for preventing overload or deleterious influence of the measured medium on the measuring device or vice versa

21/00 Vacuum gauges

23/00 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**

25/00 Testing or calibrating of apparatus for measuring force, torque, work, mechanical power, or mechanical efficiency [2]

27/00 Testing or calibrating of apparatus for measuring fluid pressure [2]

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

Note

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

Subclass index

1/00 **Testing static or dynamic balance of machines or structures** (balancing rotary bowls of centrifuges B04B 9/00; apparatus characterised by the means for holding wheels or parts thereof B60B 30/00; determining stability factors of ships B63B; stabilising of aircraft B64C 17/00; control systems for balancing automatically in operation G05; balancing rotors of dynamo-electric machines H02K 15/00)

3/00 **Investigating fluid tightness of structures** (investigating permeability of porous material, investigating the presence of flaws in general G01N)

3/02 . by using fluid or vacuum

3/04 . . by detecting the presence of fluid at the leakage point

3/06 . . . by observing bubbles in a liquid pool

3/12 . . . by observing elastic covers or coatings, e.g. soapy water

3/16 . . . using electric detection means (G01M 3/06, G01M 3/12, G01M 3/20, G01M 3/24, G01M 3/26 take precedence)

3/20 . . . using special tracer materials, e.g. dye, fluorescent material, radioactive material

3/24 . . . using infrasonic, sonic, or ultrasonic vibrations

3/26 . . by measuring rate of loss or gain of fluid, e.g. by pressure-responsive devices, by flow detectors **[2]**

3/28 . . . for pipes, cables, or tubes; for pipe joints or seals; for valves **[2]**

3/32 . . . for containers, e.g. radiators **[2]**

5/00 **Investigating the elasticity of structures, e.g. deflection of bridges, aircraft wings** (G01M 9/00 takes precedence; strain gauges G01B)

7/00 **Vibration-testing of structures**; **Shock-testing of structures** (G01M 9/00 takes precedence)

9/00 **Aerodynamic testing**; **Arrangements in or on wind tunnels** (building aspects section E; investigating properties of materials in general G01N)

10/00 **Hydrodynamic testing**; **Arrangements in or on ship-testing tanks or water tunnels** (building aspects section E; investigating properties of materials in general G01N)

11/00 **Testing of optical apparatus**; **Testing structures by optical methods not otherwise provided for**

11/02 . Testing of optical properties

11/04 . . Optical benches

11/06 . . Testing of alignment of vehicle head-light devices

11/08 . Testing of mechanical properties

13/00 **Testing of machine parts** (investigating the cutting power of tools G01N, e.g. G01N 3/00)

13/02 . Testing of gearing or of transmission mechanisms (measuring efficiency G01L)

15/00 **Testing of engines [4]**

15/02 . Details or accessories of testing apparatus **[8]**

15/04 . Testing of internal-combustion engines, e.g. diagnostic testing of piston engines **[8]**

15/14 . Testing of gas-turbine plants or jet-propulsion plants **[8]**

17/00 **Testing of vehicles** (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)

17/007 . of wheeled or endless-tracked vehicles (G01M 17/08 takes precedence) **[6]**

17/02 . . of tyres **[6]**

17/08 . of railway vehicles **[6]**

19/00 **Testing of structures or of apparatus, not provided for in the other groups of this subclass**

19/02 . Testing of sparking plugs (testing characteristics of the spark in internal-combustion engine ignition F02P 17/12; testing electric properties G01R 31/00)

G01N **INVESTIGATING OR ANALYSING MATERIALS BY DETERMINING THEIR CHEMICAL OR PHYSICAL PROPERTIES** (separating components of materials in general B01D, B01J, B03, B07; apparatus fully provided for in a single other subclass, see the relevant subclass, e.g. B01L; measuring or testing processes other than immunoassay, involving enzymes or micro-organisms C12M, C12Q; investigation of foundation soil in situ E02D 1/00; monitoring or diagnostic devices for exhaust-gas treatment apparatus F01N 11/00; sensing humidity changes for compensating measurements of other variables or for compensating readings of instruments for variations in humidity, see G01D or the relevant subclass for the variable measured; testing or determining the properties of structures G01M; measuring or investigating electric or magnetic properties of materials G01R; systems in general for determining distance, velocity or presence by use of propagation effects, e.g. Doppler effect, propagation time, of reflected or reradiated radio waves, analogous arrangements using other waves G01S; determining sensitivity, graininess, or density of photographic materials G03C 5/02; testing component parts of nuclear reactors G21C 17/00)

(1) 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.

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

(3) Investigating the properties of materials, specially adapted for use in processes covered by subclass B23K, is classified in group B23K 31/12. **[5]**

Subclass index

1/00 **Sampling**; **Preparing specimens for investigation** (handling materials for automatic analysis G01N 35/00)

1/02 . Devices for withdrawing samples (for medical or veterinary purposes A61; obtaining samples of soil or well fluids E21B 49/00)

1/04 . . in the solid state, e.g. by cutting

1/10 . . in the liquid or fluent state

1/12 . . . Dippers; Dredgers (suction dredgers E02F 3/88) **[5]**

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

1/32 . . 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** (strain gauges G01B; measuring stress in general G01L 1/00)

Note

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

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)

3/18 . . Performing tests at high or low temperatures

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 3/40)

3/32 . by applying repeated or pulsating forces (generation of such forces in general, see the relevant classes or subclasses, e.g. B06, G10)

3/40 . Investigating hardness or rebound hardness

3/56 . Investigating resistance to wear or abrasion

3/60 . Investigating resistance of materials, e.g. refractory materials, to rapid heat changes

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

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

9/00 **Investigating density or specific gravity of materials**; **Analysing materials by determining density or specific gravity** (weighing apparatus G01G)

9/24 . by observing the transmission of wave or particle radiation through the material

11/00 **Investigating flow properties of materials, e.g. viscosity, plasticity**; **Analysing materials by determining flow properties**

11/10 . by moving a body within the material

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]**

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 7/00; by filtering B01D; by sifting B07B) **[4]**

15/04 . Investigating sedimentation of particle suspensions

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]**

15/14 . . Electro-optical investigation **[4]**

17/00 **Investigating resistance of materials to the weather, to corrosion, or to light**

19/00 **Investigating materials by mechanical methods** (G01N 3/00 to G01N 17/00 take precedence; measuring roughness or irregularity of surfaces G01B 5/28)

19/02 . Measuring coefficient of friction between materials

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 to G01N 19/00 take precedence; measuring stress in general G01L 1/00; optical elements of measuring instruments G02B; image analysis by data processing G06T)

Note

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. **[7]**

21/01 . Arrangements or apparatus for facilitating the optical investigation **[3]**

21/03 . . Cuvette constructions **[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]**

21/25 . . Colour; Spectral properties, i.e. comparison of effect of material on the light at two or more different wavelengths or wavelength bands **[3]**

21/31 . . . Investigating relative effect of material at wavelengths characteristic of specific elements or molecules, e.g. atomic absorption spectrometry **[3]**

21/41 . . Refractivity; Phase-affecting properties, e.g. optical path length (G01N 21/21 takes precedence) **[3]**

21/47 . . Scattering, i.e. diffuse reflection (G01N 21/25, G01N 21/41 take precedence) **[3]**

21/55 . . Specular reflectivity **[3]**

21/59 . . Transmissivity (G01N 21/25 takes precedence) **[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]**

21/71 . . thermally excited **[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 21/71) **[3]**

21/76 . . Chemiluminescence; Bioluminescence **[3]**

21/77 . . by observing the effect on a chemical indicator **[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 21/88 takes precedence) **[3]**

21/87 . . Investigating jewels (G01N 21/88 takes precedence) **[3]**

21/88 . . Investigating the presence of flaws, defects or contamination (contactless testing of electronic circuits G01R 31/28; testing currency G07D) **[3]**

22/00 **Investigating or analysing materials by the use of microwaves** (G01N 3/00 to G01N 17/00, G01N 24/00 take precedence) **[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 to G01N 17/00 take precedence; measuring stress in general G01L 1/00; measurement of nuclear or X-radiation G01T; introducing objects or materials into nuclear reactors, or removing them therefrom, or storing them after treatment therein G21C; construction or operation of X-ray apparatus or circuits therefor H05G)

23/02 . by transmitting the radiation through the material

23/20 . by using diffraction of the radiation, e.g. for investigating crystal structure; by using reflection of the radiation

23/22 . by measuring secondary emission **[2]**

24/00 **Investigating or analysing materials by the use of nuclear magnetic resonance, electron paramagnetic resonance or other spin effects** (arrangements or instruments for measuring magnetic resonance effects G01R 33/20) **[3,4,5]**

25/00 **Investigating or analysing materials by the use of thermal means** (G01N 3/00 to G01N 23/00 take precedence)

25/02 . by investigating changes of state or changes of phase; by investigating sintering

25/18 . by investigating thermal conductivity (by calorimetry G01N 25/20; by measuring change of resistance of an electrically-heated body G01N 27/14)

25/20 . by investigating the development of heat, i.e. calorimetry, e.g. by measuring specific heat, by measuring thermal conductivity

25/56 . by investigating moisture content

25/72 . Investigating presence of flaws (by investigating thermal conductivity G01N 25/18)

27/00 **Investigating or analysing materials by the use of electric, electro-chemical, or magnetic means** (G01N 3/00 to 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; involving polarography G01N 27/48; measuring electric resistance of fluids G01R 27/22)

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

27/20 . . . Investigating the presence of flaws

27/22 . . by investigating capacitance

27/26 . by investigating electrochemical variables; by using electrolysis or electrophoresis (investigating resistance to corrosion G01N 17/00; investigating or analysing materials by separation into components using adsorption, absorption or similar phenomena or using ion-exchange, e.g. chromatography, G01N 30/00; immunoelectrophoresis G01N 33/558; electrochemical processes or apparatus in general B01J; standard cells H01M 6/28) **[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 27/403 takes precedence) **[5]**

27/327 . . . . Biochemical electrodes **[5]**

27/333 . . . . Ion-selective electrodes or membranes (glass electrodes G01N 27/36) **[5]**

27/36 . . . . Glass electrodes

27/40 . . . Semi-permeable membranes or partitions

27/403 . . Cells and electrode assemblies **[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]**

27/416 . . Systems (G01N 27/27 takes precedence) **[5]**

27/417 . . . using cells and probes with solid electrolytes **[5]**

27/42 . . . Measuring deposition or liberation of materials from an electrolyte; Coulometry, i.e. measuring coulomb-equivalent of material in an electrolyte **[5]**

27/447 . . . 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 (by investigating capacitance G01N 27/22)

27/62 . by investigating the ionisation of gases; by investigating electric discharges, e.g. emission of cathode (particle spectrometers H01J 49/00)

27/64 . . using wave or particle radiation to ionise a gas, e.g. in an ionisation chamber

27/68 . . using electric discharge to ionise a gas

27/72 . by investigating magnetic variables

27/74 . . of fluids (G01N 24/00 takes precedence)

27/80 . . for investigating mechanical hardness, e.g. by investigating saturation or remanence of ferromagnetic material

27/82 . . for investigating the presence of flaws

27/90 . . . using eddy currents **[3]**

27/92 . by investigating breakdown voltage (G01N 27/60, G01N 27/62 take precedence; testing of articles or specimens of solids or fluids for dielectric strength or breakdown voltage G01R 31/12) **[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 to G01N 27/00 take precedence; measuring or indicating of ultrasonic, sonic or infrasonic waves in general G01H; systems using the reflection or reradiation of acoustic waves, e.g. acoustic imaging, G01S 15/00; obtaining records by techniques analogous to photography using ultrasonic, sonic or infrasonic waves G03B 42/00) **[4]**

29/02 . Analysing fluids (using acoustic emission techniques G01N 29/14) **[5,8]**

29/04 . Analysing solids (using acoustic emission techniques G01N 29/14) **[4,5,8]**

29/06 . . Visualisation of the interior, e.g. acoustic microscopy **[4,8]**

29/12 . . by measuring frequency or resonance of acoustic waves **[5,8]**

29/14 . using acoustic emission techniques **[5,8]**

29/22 . Details **[5]**

29/24 . . Probes **[5]**

29/26 . . Arrangements for orientation or scanning **[5]**

29/28 . . providing acoustic coupling **[5]**

29/34 . Generating the ultrasonic, sonic or infrasonic waves **[8]**

29/36 . Detecting the response signal **[8]**

29/44 . Processing the detected response signal **[8]**

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 to G01N 29/00 take precedence; separation for the preparation or production of components B01D 15/00, B01D 53/02, B01D 53/14) **[4]**

31/00 **Investigating or analysing non-biological materials by the use of the chemical methods specified in the subgroups** (testing the effectiveness or completeness of sterilisation procedures without using enzymes or microorganisms A61L 2/26; measuring or testing processes involving enzymes or micro-organisms C12Q 1/00); **Apparatus specially adapted for such methods [4]**

Note

The observation of the progress of the reactions covered by groups G01N 31/02 to G01N 31/22 by any of the methods specified in groups G01N 3/00 to 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
31/20 . 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 to G01N 31/00

33/02 . Food
33/15 . Medicinal preparations **[3]**
33/18 . Water
33/20 . Metals
33/22 . Fuels; explosives
33/24 . Earth materials (G01N 33/42 takes precedence)
33/26 . Oils; viscous liquids; paints; inks (G01N 33/22 takes precedence; edible oils or edible fats G01N 33/02)
33/34 . Paper
33/36 . Textiles
33/38 . Concrete; lime; mortar; gypsum; bricks; ceramics; glass
33/40 . Grinding-materials
33/42 . Road-making materials (G01N 33/38 takes precedence)
33/44 . Resins; plastics; rubber; leather
33/46 . Wood
33/48 . Biological material, e.g. blood, urine (G01N 33/02, G01N 33/26, G01N 33/44, G01N 33/46 take precedence; determining the germinating capacity of seeds A01C 1/00); Haemocytometers (counting blood corpuscules distributed over a surface by scanning the surface G06M 11/00) **[3,4]**
33/483 . . Physical analysis of biological material **[4]**
33/487 . . . of liquid biological material **[4]**
33/49 . . . . blood **[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]**

Note

In this group, the following expression is used with the meaning indicated:
– "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. **[3]**

Note

In groups G01N 33/52 to G01N 33/98, in the absence of an indication to the contrary, classification is made in the last appropriate place. **[3]**

33/52 . . . Use of compounds or compositions for colorimetric, spectrophotometric or fluorometric investigation, e.g. use of reagent paper **[3]**
33/53 . . . Immunoassay; Biospecific binding assay; Materials therefor (medicinal preparations containing antigens or antibodies A61K; haptens in general, see the relevant places in class C07; peptides, e.g. proteins, in general C07K) **[4]**
33/531 . . . . Production of immunochemical test materials **[4]**
33/532 . . . . . Production of labelled immunochemicals **[4]**
33/533 . . . . . with fluorescent label **[4]**
33/534 . . . . . with radioactive label **[4]**
33/535 . . . . . with enzyme label **[4]**
33/536 . . . . with immune complex formed in liquid phase **[4]**
33/543 . . . . with an insoluble carrier for immobilising immunochemicals **[4]**
33/544 . . . . . the carrier being organic **[4]**
33/551 . . . . . the carrier being inorganic **[4]**
33/554 . . . . . the carrier being a biological cell or cell fragment, e.g. bacteria, yeast cells **[4]**
33/557 . . . . using kinetic measurement, i.e. time rate of progress of an antigen-antibody interaction **[4]**
33/558 . . . . using diffusion or migration of antigen or antibody **[4]**
33/563 . . . . involving antibody fragments **[4]**
33/564 . . . . for pre-existing immune complex or autoimmune disease **[4]**
33/566 . . . . using specific carrier or receptor proteins as ligand binding reagent **[4]**
33/567 . . . . . utilising isolate of tissue or organ as binding agent **[4]**
33/569 . . . . for micro-organisms, e.g. protozoa, bacteria, viruses **[4]**
33/571 . . . . . for venereal disease, e.g. syphilis, gonorrhoea, herpes **[4]**
33/573 . . . . for enzymes or isoenzymes **[4]**
33/574 . . . . for cancer **[4]**
33/576 . . . . for hepatitis **[4]**
33/577 . . . . involving monoclonal antibodies **[4]**
33/579 . . . involving limulus lysate **[4]**
33/58 . . . involving labelled substances (G01N 33/53 takes precedence; for testing in vivo A61K 51/00) **[3]**
33/60 . . . . involving radioactive labelled substances (tracers G21H 5/00) **[3]**
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]**
33/80 . . . 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 to G01N 33/00**; **Handling materials therefor [3]**

35/02 . using a plurality of sample containers moved by a conveyer system past one or more treatment or analysis stations **[3]**

35/04 . . Details of the conveyer 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, ABSENCE, OR DIRECTION, OF MOVEMENT** (measuring or recording blood flow A61B 5/02, A61B 8/06; monitoring speed or deceleration of electrically-propelled vehicles B60L 3/00; vehicle lighting systems adapted to indicate speed B60Q 1/50; determining position or course in navigation, measuring ground distance in geodesy or surveying G01C; combined measuring devices for measuring two or more variables of movement G01C 23/00; measuring velocity of sound G01H; 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, direction of propagation, G01S; measuring speed of nuclear radiation G01T; measuring acceleration of gravity G01V)

(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". **[4]**

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

Subclass index

1/00 **Details of instruments**

3/00 **Measuring linear or angular speed**; **Measuring differences of linear or angular speeds** (G01P 5/00 to G01P 11/00 take precedence; counting mechanisms G06M)

Note

Groups G01P 3/02 to 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

3/26 . Devices characterised by the use of fluids

3/36 . Devices characterised by the use of optical means, e.g. using infra-red, visible, or ultra-violet light (G01P 3/64 takes precedence; gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams, G01C 19/64)

3/42 . Devices characterised by the use of electric or magnetic means (G01P 3/64 takes precedence; measuring electric or magnetic values in general G01R)

3/62 . Devices characterised by the determination of the variation of atmospheric pressure with height to measure the vertical components of speed (measuring pressure in general G01L)

3/64 . Devices characterised by the determination of the time taken to traverse a fixed distance

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)

5/02 . by measuring forces exerted by the fluid on solid bodies, e.g. anemometer

5/10 . by measuring thermal variables

5/14 . by measuring differences of pressure in the fluid

5/18 . by measuring the time taken by the fluid to traverse a fixed distance **[1,7]**

7/00 **Measuring speed by integrating acceleration** (measuring travelled distance by double integration of acceleration G01C 21/10)

9/00 **Measuring speed by using gyroscopic effect, e.g. using gas, using electron beam** (gyroscopes or turn-sensitive devices per se G01C 19/00)

9/04 . using turn-sensitive devices with vibrating masses, e.g. tuning-fork

11/00 **Measuring average value of speed** (by determining time taken to traverse a fixed distance G01P 3/64, G01P 5/18)

13/00 **Indicating or recording presence, absence, or direction, of movement** (counting moving objects G06M 7/00; electric switches H01H)

13/02 . Indicating direction only, e.g. by weather vane

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, G01P 15/18 take precedence) **[1,7]**

15/08 . . with conversion into electric or magnetic values

15/09 . . . by piezo-electric 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]**

15/14 . by making use of gyroscopes (G01P 15/18 takes precedence; gyroscopes per se G01C 19/00) **[1,7]**

15/16 . by evaluating the time-derivative of a measured speed signal (G01P 15/18 takes precedence) **[3,7]**

15/18 . in two or more dimensions **[7]**

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

G01Q ***SCANNING-PROBE TECHNIQUES OR APPARATUS; APPLICATIONS OF SCANNING-PROBE TECHNIQUES, E.G. SCANNING-PROBE MICROSCOPY [SPM]*** **[2010.01]**

Note

In this subclass, the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place. **[2010.01]**

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

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

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

60/10 . *STM [Scanning Tunnelling Microscopy] or apparatus therefor, e.g. STM probes* **[2010.01]**

60/18 . *SNOM [Scanning Near-Field Optical Microscopy] or apparatus therefor, e.g. SNOM probes* **[2010.01]**

60/24 . *AFM [Atomic Force Microscopy] or apparatus therefor, e.g. AFM probes* **[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]**

60/50 . *MFM [Magnetic Force Microscopy] or apparatus therefor, e.g. MFM probes* **[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]**

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 9/00, G11B 11/00 or G11B 13/00)* **[2010.01]**

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

G01R **MEASURING ELECTRIC VARIABLES**; **MEASURING MAGNETIC VARIABLES** (measuring physical variables of any kind by conversion into electric variables, see Note (4) following the title of class G01; measuring diffusion of ions in an electric field, e.g. electrophoresis, electro-osmosis, G01N; investigating non-electric or non-magnetic properties of materials by using electric or magnetic methods G01N; indicating correct tuning of resonant circuits H03J 3/00; monitoring electronic pulse counters H03K 21/00; monitoring operation of communication systems H04)

(1) 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; **[5]**

– equipment for generating signals to be used for carrying out such tests and measurements.

(2) 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;

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

(4) In this subclass, instruments or arrangements for measuring electric variables are classified in the following way: **[8]**
– Electromechanical instruments where the measured electric variables direcly effect the indication of the measured value, including combined effects of two or more values, are classified in groups G01R 5/00 to G01R 11/00. **[8]**
– Details common to different types of the instruments covered by groups G01R 5/00 to G01R 11/00 are classified in group G01R 1/00. **[8]**
– 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 to G01R 29/00. **[8]**
– Details common to different types of arrangements covered by groups G01R 17/00 to G01R 29/00 are classified in group G01R 15/00. **[8]**

(5) In this subclass, group G01R 17/00 takes precedence over groups G01R 19/00 to G01R 31/00.

Subclass index

1/00 **Details of instruments or arrangements of the types included in groups G01R 5/00 to G01R 13/00 and G01R 31/00** (constructional details particular to arrangements for measuring the electric consumption G01R 11/00) **[3,8]**

1/02 . General constructional details (details of a kind applicable to measuring arrangements not specially adapted for a specific variable G01D 7/00)

1/06 . . Measuring leads; Measuring probes (G01R 19/145, G01R 19/165 take precedence; end pieces for leads H01R 11/00) **[3]**

1/067 . . . Measuring probes **[3]**

1/073 . . . . Multiple probes **[3]**

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** (vibration galvanometers G01R 9/00)

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

9/00 **Instruments employing mechanical resonance**

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)

13/00 **Arrangements for displaying electric variables or waveforms** (display by mechanical displacement only G01R 5/00, G01R 7/00, G01R 9/00; recording frequency spectrum G01R 23/16) **[4]**

13/20 . Cathode-ray oscilloscopes (cathode-ray tubes H01J 31/00)

13/22 . . Circuits therefor (circuits for generating pulses, e.g. sawtooth waveforms H03K 3/00)

15/00 **Details of measuring arrangements of the types provided for in groups G01R 17/00 to G01R 29/00, G01R 33/00 to G01R 33/24 and G01R 35/00** (details of instruments G01R 1/00; measuring leads, measuring probes G01R 1/06; overload protection arrangements G01R 1/00; circuits for correcting the transfer function G01D 3/02) **[1,8]**

15/14 . Adaptations providing voltage or current isolation, e.g. for high-voltage or high-current networks (voltage dividers G01R 15/00) **[6]**

15/24 . . using light-modulating devices **[6]**

17/00 **Measuring arrangements involving comparison with a reference value, e.g. bridge**

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

Within groups G01R 19/02 to G01R 19/32, group G01R 19/28 takes precedence. Groups G01R 19/18 to G01R 19/25 take precedence over groups G01R 19/02 to G01R 19/165 and G01R 19/30. **[3]**

19/02 . Measuring effective values, i.e. root-mean-square values

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]**

19/165 . Indicating that current or voltage is either above or below a predetermined value or within or outside a predetermined range of values (circuits with regenerative action, e.g. Schmitt trigger H03K 3/00; threshold switches H03K 17/00) **[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

19/22 . using conversion of ac into dc

19/25 . using digital measurement techniques (arrangements for displaying measured electric variables in digital form G01R 13/00) **[3]**

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; modifications of instruments to indicate the maximum or the minimum value reached in a time interval G01R 1/00) **[2,3]**

19/32 . Compensating for temperature change (modifications of instruments for temperature compensation G01R 1/00) **[2]**

21/00 Arrangements for measuring electric power or power factor (G01R 7/00 takes precedence) **[4]**

22/00 Arrangements for measuring time integral of electric power or current, e.g. electricity meters (electromechanical arrangements therefor G01R 11/00; monitoring electric consumption of electrically-propelled vehicles B60L 3/00) **[4,8]**

Note

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. **[4]**

22/06 . by electronic methods **[8]**

23/00 Arrangements for measuring frequencies; **Arrangements for analysing frequency spectra** (frequency discriminators H03D)

23/16 . Spectrum analysis; Fourier analysis

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 (measuring power factor G01R 21/00; measuring position of individual pulses in a pulse train G01R 29/02; phase discriminators H03D) **[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

27/08 . . Measuring resistance by measuring both voltage and current

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

27/20 . . Measuring earth resistance; Measuring contact resistance of earth connections, e.g. plates

27/22 . . Measuring resistance of fluids (measuring vessels, electrodes therefor G01N 27/06)

27/26 . . Measuring inductance or capacitance; Measuring quality factor, e.g. by using the resonance method; Measuring loss factor; Measuring dielectric constants

29/00 Arrangements for measuring or indicating electric quantities not covered by groups G01R 19/00 to G01R 27/00

29/02 . Measuring characteristics of individual pulses, e.g. deviation from pulse flatness, rise time, duration (of amplitude G01R 19/00; of repetition rate G01R 23/00; of phase difference of two cyclic pulse trains G01R 25/00; monitoring pattern of pulse trains H03K 5/19) **[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

29/24 . Arrangements for measuring quantities of charge (electrostatic instruments G01R 5/00; indicating presence of current G01R 19/145; arrangements for measuring time integral of electric power or current G01R 22/00) **[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** (measuring leads, measuring probes G01R 1/06; indicating electrical condition of switchgear or protective devices H01H 71/04, H01H 73/00, H02B 11/00, H02H 3/02; 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 31/12 takes precedence) **[6]**

31/02 . Testing of electric apparatus, lines, or components for short-circuits, discontinuities, leakage, or incorrect line connection

31/08 . Locating faults in cables, transmission lines, or networks (emergency protective circuit arrangements H02H)

31/12 . Testing dielectric strength or breakdown voltage

31/24 . Testing of discharge tubes (during manufacture H01J 9/42) **[2]**

31/26 . Testing of individual semiconductor devices (measurement of impurity content of materials G01N) **[2]**

31/28 . Testing of electronic circuits, e.g. by signal tracer (testing for short-circuits, discontinuities, leakage or incorrect line connection G01R 31/02; checking computers G06F 11/00; checking static stores for correct operation or testing static stores during standby or offline operation G11C 29/00)

31/327 . Testing of circuit interrupters, switches or circuit-breakers (structural association with switches H01H) **[6]**

31/34 . Testing dynamo-electric machines (testing electric windings G01R 31/02; methods or apparatus specially adapted for manufacturing, assembling, maintaining or repairing dynamo-electric machines H02K 15/00) **[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 10/42; circuit arrangements for charging, or depolarising batteries or for supplying loads from batteries H02J 7/00) **[3]**

31/38 . Testing of sparking-plugs (testing non-electrical properties G01M 19/02) **[6]**

31/40 . Testing power supplies **[6]**

31/44 . Testing lamps (discharge lamps G01R 31/24; structurally associated with light source circuit arrangements for detecting lamp failure H05B 37/00) **[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; measuring direction or magnitude of the earth's field for navigation or surveying G01C; for prospecting, for measuring the magnetic field of the earth G01V 3/00) **[4]**

33/022 . . Measuring gradient **[3]**

Note

Group G01R 33/022 or group G01R 33/10 takes precedence over groups G01R 33/025 to 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

33/06 . . using galvano-magnetic devices

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]**

33/16 . . Measuring susceptibility

33/18 . . Measuring magnetostrictive properties

33/20 . involving magnetic resonance (medical aspects A61B 5/055; magnetic resonance gyrometers G01C 19/58) **[4,5]**

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

33/28 . . Details of apparatus provided for in groups G01R 33/44 to G01R 33/64 **[5]**

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

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

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

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

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

33/48 . . . NMR imaging systems **[5]**

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

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

(1) In this subclass, the following term is used with the meaning indicated: **[6]**
– "transponder" means an arrangement which reacts to an incoming interrogating or detecting wave by emitting a specific answering or identifying wave. **[6]**

(2) Attention is drawn to the Notes following the title of class G01 and to Note (1) following the title of subclass G09B.

Subclass index

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]**

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

3/14 . . Systems for determining direction or deviation from predetermined direction

3/78 . using electromagnetic waves other than radio waves

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

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

7/28 . . Details of pulse systems

7/285 . . . 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]**

7/36 . . Means for anti-jamming

7/38 . . Jamming means, e.g. producing false echoes **[2]**

7/40 . . Means for monitoring or calibrating

7/48 . of systems according to group G01S 17/00

7/481 . . Constructional features, e.g. arrangements of optical elements **[6]**

7/52 . of systems according to group G01S 15/00

7/521 . . Constructional features **[6]**

7/523 . . Details of pulse systems **[6]**

7/534 . . Details of non-pulse systems **[6]**

7/537 . . Counter measures or counter-counter-measures, e.g. jamming, anti-jamming **[6]**

7/539 . . using analysis of echo signal for target characterisation; Target signature; Target cross-section **[6]**

7/54 . . with receivers spaced apart

7/56 . . Display arrangements

7/64 . . Luminous indications (G01S 7/56 takes precedence) **[5]**

11/00 **Systems for determining distance or velocity not using reflection or reradiation** (position-fixing by co-ordinating two or more distance determinations G01S 5/00) **[2]**

(1) Groups G01S 13/00 to G01S 17/00 cover:
- 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; **[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. **[3]**

(2) Groups G01S 13/00 to G01S 17/00 do not cover:
- 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; **[3]**
- systems for determining distance or velocity of an object by means not employing reflection or reradiation, which are covered by group G01S 11/00. **[3]**

13/00 **Systems using the reflection or reradiation of radio waves, e.g. radar systems**; **Analogous systems using reflection or reradiation of waves whose nature or wavelength is irrelevant or unspecified [3]**

15/00 **Systems using the reflection or reradiation of acoustic waves, e.g. sonar systems [3]**

17/00 **Systems using the reflection or reradiation of electromagnetic waves other than radio waves, e.g. lidar systems [3]**

19/00 ***Satellite radio beacon positioning systems; Determining position, velocity or attitude using signals transmitted by such systems*** **[2010.01]**

G01T **MEASUREMENT OF NUCLEAR OR X-RADIATION** (radiation analysis of materials, mass spectrometry G01N 23/00; electric discharge tubes for analysing radiation or particles H01J 40/00, H01J 47/00, H01J 49/00)

(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 **Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation** (G01T 3/00, G01T 5/00 take precedence) **[2]**

1/02 . Dosimeters (G01T 1/15 takes precedence) **[2]**

1/15 . Instruments in which pulses generated by a radiation detector are integrated, e.g. by a diode pump circuit

3/00 **Measuring neutron radiation** (G01T 5/00 takes precedence) **[2]**

5/00 **Recording of movements or tracks of particles** (spark chambers H01J 47/00); **Processing or analysis of such tracks [2]**

7/00 **Details of radiation-measuring instruments**

G01V **GEOPHYSICS**; **GRAVITATIONAL MEASUREMENTS**; **DETECTING MASSES OR OBJECTS**; **TAGS** (means for indicating the location of accidentally buried, e.g. snow-buried, persons A63B 29/00) **[4,6]**

(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. **[6]**
(2) In this subclass, the following term is used with the meaning indicated: **[6]**
– "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. **[6]**
(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

1/00 **Seismology**; **Seismic or acoustic prospecting or detecting**

1/02 . Generating seismic energy

1/16 . Receiving elements for seismic signals; Arrangements or adaptations of receiving elements

1/22 . Transmitting seismic signals to recording or processing apparatus

1/28 . Processing seismic data, e.g. analysis, for interpretation, for correction (G01V 1/40 takes precedence) **[6]**

1/38 . specially adapted for water-covered areas (G01V 1/28 takes precedence)

1/40 . specially adapted for well-logging

3/00 **Electric or magnetic prospecting or detecting**; **Measuring magnetic field characteristics of the earth, e.g. declination or deviation [2,4]**

Note

Groups G01V 3/15 to G01V 3/18 take precedence over groups G01V 3/02 to G01V 3/14. **[3]**

3/02 . operating with propagation of electric current

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

3/12 . 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]**

3/18 . specially adapted for well-logging

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

7/00 Measuring gravitational fields or waves; Gravimetric prospecting or detecting

8/00 Prospecting or detecting by optical means [6]

Note

This group covers the use of infra-red, visible or ultra-violet light. **[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]**

9/00 Prospecting or detecting by methods not provided for in groups G01V 1/00 to G01V 8/00 [6]

11/00 Prospecting or detecting by methods combining techniques covered by two or more of main groups G01V 1/00 to G01V 9/00

13/00 Manufacturing, calibrating, cleaning, or repairing instruments or devices covered by groups G01V 1/00 to G01V 11/00

15/00 Tags attached to, or associated with, an object, in order to enable detection of the object (record carriers for use with machines having a detectable tag or marker G06K 19/00) **[6]**

Note

This group does not cover 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. **[6]**

99/00 Subject matter not provided for in other groups of this subclass [2009.01]

G01W METEOROLOGY (influencing weather conditions A01G 15/00; dispersing fog E01H 13/00; instruments for measuring single variables in general, see the appropriate subclasses of class G01, e.g. G01K, G01L; radar, sonar, lidar or analogous systems, designed for meteorological use G01S 13/00, G01S 15/00, G01S 17/00)

(1) In this subclass, the following term is used with the meaning indicated:
– "meteorology" includes measurement of certain ambient atmospheric conditions.

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

1/00 Meteorology

1/10 . Devices for predicting weather conditions

1/14 . Rainfall or precipitation gauges (measuring volume in general G01F)

G02 OPTICS (making optical elements or apparatus B24B, B29D 11/00, C03, or other appropriate subclasses or classes; materials per se, see the relevant places, e.g. C03B, C03C)

Note

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. **[4]**

G02B OPTICAL ELEMENTS, SYSTEMS, OR APPARATUS (G02F takes precedence; optical elements specially adapted for use in lighting devices or systems thereof F21V 1/00 to 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 11/00; electron and ion "optics" H01J; X-ray "optics" H01J, H05G 1/00; optical elements structurally combined with electric discharge tubes H01J 5/02, 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]**

(1) 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". **[7]**

Subclass index

1/00 Optical elements characterised by the material of which they are made (compositions of optical glasses C03C 3/00); **Optical coatings for optical elements**

1/04 . made of organic materials, e.g. plastics (G02B 1/08 takes precedence)

1/08 . made of polarising materials

1/10 . Optical coatings produced by application to, or surface treatment of, optical elements (G02B 1/08 takes precedence)

3/00 Simple or compound lenses (artificial eyes A61F 2/14; spectacle lenses or contact lenses for the eyes G02C; watch or clock glasses G04B 39/00)

3/02 . with non-spherical faces (G02B 3/10 takes precedence)

3/08 . . with discontinuous faces, e.g. Fresnel lens

3/10 . Bifocal lenses; Multifocal lenses

3/12 . Fluid-filled or evacuated lenses

5/00 Optical elements other than lenses (light guides G02B 6/00; optical logic elements G02F 3/00) **[4]**

5/02 . Diffusing elements; Afocal elements

5/04 . Prisms

5/06 . . Fluid-filled or evacuated prisms

5/08 . Mirrors

5/09 . . Multifaceted or polygonal mirrors **[6]**

5/10 . . with curved faces

5/12 . Reflex reflectors

5/18 . Diffracting gratings

5/20 . Filters (polarising elements G02B 5/30; filters specially adapted for photographic purposes G03B 11/00)
5/22 . . Absorbing filters
5/26 . . Reflecting filters (G02B 5/28 takes precedence)
5/28 . . Interference filters
5/30 . Polarising elements (light-modulating devices G02F 1/00)
5/32 . Holograms used as optical elements (processes or apparatus for producing holograms G03H) **[2]**

6/00 Light guides; Structural details of arrangements comprising light guides and other optical elements, e.g. couplings [4,6]

6/02 . Optical fibre with cladding (mechanical structures for providing tensile strength and external protection G02B 6/44) **[4,8]**
6/04 . formed by bundles of fibres (G02B 6/24 takes precedence) **[4]**
6/06 . . the relative position of the fibres being the same at both ends, e.g. for transporting images **[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 11/21; electric waveguides H01P; transmission of information by optical means H04B 10/00; multiplex systems H04J 14/00) **[4,8]**
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]**
6/14 . . 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 5/00) **[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 11/00) **[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]**

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
7/18 . 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]**
7/198 . . . with means for adjusting the mirror relative to its support **[5]**
7/20 . Light-tight connections for movable optical elements
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 parallactic 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]**
7/40 . . 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

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.

9/12 . having three components only

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)

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 . Anamorphotic objectives

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

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

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]**

15/177 . . . 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]**

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]**

17/08 . Catadioptric systems

19/00 **Condensers** (for microscopes G02B 21/06)

21/00 **Microscopes** (eyepieces G02B 25/00; polarising systems G02B 27/28; measuring microscopes G01B 9/04; microtomes G01N 1/04; scanning-probe techniques or apparatus G01Q) **[1,7]**

21/02 . Objectives

21/06 . Means for illuminating specimen

21/16 . adapted for ultra-violet illumination

21/18 . Arrangements with more than one light-path, e.g. for comparing two specimens

21/24 . Base structure

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)

23/14 . Viewfinders (for photographic apparatus G03B 13/02)

23/16 . Housings; Caps; Mountings; Supports, e.g. with counterweight (cases or receptacles A45C)

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)

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 to H05B 43/00) **[4]**

26/02 . for controlling the intensity of light **[4]**

26/08 . for controlling the direction of light (in light guides G02B 6/35) **[4]**

26/10 . . Scanning systems (for special applications, see the relevant places, e.g. G03B 27/32, G03F 3/00, 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 11/00; 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
27/18 . 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 21/18; viewing apparatus G02B 27/02)
27/28 . for polarising (used in stereoscopes G02B 27/22)
27/30 . Collimators
27/32 . Fiducial marks or measuring scales within the optical system
27/40 . Optical focusing aids (beam splitting or combining systems G02B 27/10)
27/42 . Diffraction optics (G02B 27/60 takes precedence) **[3]**
27/46 . . Systems using spatial filters (character recognition G06K 9/00) **[3]**

Note

In this group, the filter may be in any plane, e.g. the image or the Fourier transfer plane. **[3]**

27/48 . Laser speckle optics (speckle suppression in holography G03H 1/00) **[3]**
27/50 . Optics for phase object visualisation (in microscopes G02B 21/06) **[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 5/26) **[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** (trial frames for testing the eyes A61B 3/02; goggles or eyeshields not having the same features as spectacles A61F 9/00)

Note

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

Subclass index

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

3/00 **Special supporting arrangement for lens assemblies or monocles** (lenses therefor G02C 7/00; by walking-sticks A45B 3/00)

5/00 **Constructions of non-optical parts**
5/14 . Side-members
5/22 . Hinges (pivotal connection in general F16C 11/00)

7/00 **Optical parts** (characterised by the material G02B 1/00)
7/02 . Lenses; Lens systems
7/04 . . Contact lenses for the eyes (disinfection or sterilisation of contact lenses A61L 12/00)
7/06 . . bifocal; multifocal

9/00 **Attaching auxiliary optical parts**

11/00 **Non-optical adjuncts** (H05B 3/84 takes precedence); **Attachment thereof** (G02C 7/00 takes precedence; cases A45C 11/04)

13/00 **Assembling** (producing spectacle frames from plastics or from substances in a plastic state B29D 12/00); **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** (optical transfer means between sensing member and indicating or recording part in connection with measuring G01D 5/26; devices in which mathematical operations are carried out with optical elements G06E 3/00; electrical signal transmission systems using optical means to convert the input signal G08C 19/36; information-recording by electric or magnetic means and reproducing by sensing optical properties G11B 11/00; static stores using optical elements G11C 13/04; transmission systems employing electromagnetic waves other than radio waves, e.g. light, infra-red radiation, H04B 10/00; optical multiplex systems H04J 14/00; pictorial communication, e.g. television H04N) **[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** (thermometers using change of colour or translucency G01K 11/00, using changes in fluorescence G01K 11/00; light guide devices G02B 6/00; optical devices or arrangements using movable or deformable elements for controlling light independent of the light source G02B 26/00; control of light in general G05D 25/00; visible signalling systems G08B 5/00; indicating arrangements for variable information by selection or combination of individual elements G09F 9/00; control arrangements or circuits for visual indicators other than cathode-ray tubes G09G 3/00; control of light sources H01S 3/10, H05B 33/02, H05B 35/00 to H05B 43/00) **[2,4]**

Note

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; **[2]**
- 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; **[2]**
- control of light by electromagnetic waves, e.g. radio waves, or by electrons or other elementary particles. **[2]**

1/01 **.** for the control of the intensity, phase, polarisation or colour (G02F 1/29, G02F 1/35 take precedence; polarizing elements per se G02B 5/30; static storage per se G11C; image tube screens acting as light valves by shutter operation H01J 29/10; such screen acting by discoloration H01J 29/10) **[2,7]**

1/13 **. .** based on liquid crystals, e.g. single liquid crystal display cells (liquid crystal materials C09K 19/00) **[2]**

1/29 **.** for the control of the position or the direction of light beams, i.e. deflection (static stores with electric or magnetic read-in and optical read-out G11C; lasers provided with means to change the location from which, or the direction in which, laser radiation is emitted H01S 3/101) **[4]**

1/35 **.** Non-linear optics (optical bistable devices G02F 3/00; lasers using stimulated Brillouin or Raman effect H01S 3/30) **[2,5]**

2/00 **Demodulating light**; **Transferring the modulation of modulated light**; **Frequency-changing of light** (G02F 1/35 takes precedence; photoelectric detecting or measuring devices G01J, H01J 40/00, H01L 31/00; demodulating laser arrangements H01S 3/10; demodulation or transference of modulation of modulated electromagnetic waves in general H03D 9/00) **[2]**

3/00 **Optical logic elements** (electric-pulse generators using opto-electronic devices as active elements H03K 3/00; logic circuits using opto-electronic devices H03K 19/02); **Optical bistable devices [5]**

7/00 **Optical analogue/digital converters**

Note

This group covers only converters based in substantial manner on elements which are provided for in group G02F 1/00. **[4]**

G03 PHOTOGRAPHY; CINEMATOGRAPHY; ANALOGOUS TECHNIQUES USING WAVES OTHER THAN OPTICAL WAVES; ELECTROGRAPHY; HOLOGRAPHY (reproduction of pictures or patterns by scanning and converting into electrical signals H04N) **[4]**

Note

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. **[4]**

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

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 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

1/18 . Moving film strip by means which act on the film between the ends thereof

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)

3/10 . Power-operated focusing

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 (measuring intensity of light G01J; control of exposure in television cameras by means of circuitry for compensating for variation in the brightness of the object H04N 5/235)

7/08 . Control effected solely by response to built-in light-sensitive device to the intensity of light received by the camera

7/091 . . Digital circuits **[3]**

7/099 . . Arrangement of photoelectric elements in or on the camera **[3]**

7/16 . in accordance with both the intensity of the flash source and the distance of the flash source from object, e.g. in accordance with "guide number" of flash bulb and the focusing of the camera

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
7/24 . 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]**

9/00 Exposure-making shutters; **Diaphragms**
9/02 . Diaphragms **[2]**
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
9/36 . . Sliding rigid plate

11/00 Filters or other obturators specially adapted for photographic purposes (filters per se G02B)

13/00 Viewfinders; **Focusing aids for cameras**; **Means for focusing for cameras**; **Autofocus systems for cameras** (hoods, caps G03B 11/00; reflex camera arrangements G03B 19/12, G03B 19/02; rangefinders per se G01C 3/00; automatic focusing in general G02B 7/09; systems for automatic generation of focusing signals G02B 7/28) **[5]**
13/02 . Viewfinders
13/04 . . of direct-vision type, e.g. frame, sighting mark
13/06 . . with lenses with or without reflectors
13/10 . . adjusting viewfinder field
13/12 . . . to compensate for change of camera lens or size of picture
13/16 . . combined with focusing aids
13/18 . Focusing aids
13/32 . Means for focusing **[5]**
13/34 . . Power focusing **[5]**
13/36 . . . Autofocus systems **[5]**

15/00 Special procedures for taking photographs; **Apparatus therefor**
15/02 . Illuminating scene
15/03 . . Combinations of cameras with lighting apparatus; Flash units
15/05 . . . Combinations of cameras with electronic flash apparatus; Electronic flash units (discharge lamps per se H01J; circuit arrangements H05B 41/00)
15/08 . Trick photography

17/00 Details of cameras or camera bodies; **Accessories therefor** (lens hoods or caps G03B 11/00)
17/02 . Bodies
17/04 . . collapsible, foldable, or extensible, e.g. book type (bellows for instruments in general G12B)
17/06 . . with exposure meters or other indicators built into body but not connected to other camera members
17/08 . . Waterproof bodies or housings
17/10 . . Soundproof bodies
17/12 . . with means for supporting objectives, supplementary lenses, filters, masks, or turrets
17/16 . . for containing both motion-picture camera and still-picture camera
17/17 . . with reflectors arranged in beam forming the photographic image, e.g. for reducing dimensions of camera
17/18 . Signals indicating condition of a camera member or suitability of light (indicating depth of field G03B 13/18)
17/20 . . visible in viewfinder
17/22 . with means for cutting-off film
17/24 . with means for separately producing marks on the film, e.g. title, time of exposure
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]**
17/28 . Locating light-sensitive material within camera
17/30 . . Locating spools or other rotatable holders of coiled film
17/32 . . Locating plates or cut films
17/36 . Counting number of exposures (of film strips G03B 1/00; counting mechanisms in general G06M)
17/38 . Releasing-devices separate from shutter (integral with shutter G03B 9/08)
17/42 . Interlocking between shutter operation and advance of film or change of plate or cut-film
17/44 . Means for exchanging focusing screen and light-sensitive material
17/46 . Means for exposing single frames in motion-picture camera
17/48 . adapted for combination with other photographic or optical apparatus (with microscopes, with telescopes G02B)
17/55 . with provision for heating or cooling, e.g. in aircraft
17/56 . Accessories (carrying-cases A45C)

19/00 Cameras (details G03B 17/00; motion picture cameras with non-intermittently running film G03B 41/00)
19/02 . Still-picture cameras
19/12 . . Reflex cameras with single objective and a movable reflector or a partly-transmitting mirror

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
21/06 . 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)
21/12 . adapted for projection of either still pictures or motion pictures (prolonged exhibition of single frame G03B 21/32)
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 41/00)
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
21/60 . . . characterised by the nature of the surface, e.g. lenticular, fluid
21/62 . . . . translucent

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

Note

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.

25/00 Viewers, other than projection viewers, giving motion-picture effects by persistence of vision, e.g. zoetrope (high-speed photography G03B 39/00)

27/00 Photographic printing apparatus (film-strip handling G03B 1/00)
27/02 . Exposure apparatus for contact printing
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]**
27/42 . . 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]**
27/62 . . . 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 5/02, 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 5/62)

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)

35/00 Stereoscopic photography (panoramic or wide-screen systems G03B 37/00; photogrammetry G01C)
35/18 . by simultaneous viewing

37/00 Panoramic or wide-screen photography; **Photographing extended surfaces, e.g. for surveying**; **Photographing internal surfaces, e.g. of pipe**

39/00 High-speed photography

41/00 Special photographic techniques not covered by groups G03B 31/00 to G03B 39/00; **Apparatus therefor [2]**

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]**

43/00 **Testing correct operation of photographic apparatus or parts thereof** (measuring specific variables G01)

G03C **PHOTOSENSITIVE MATERIALS FOR PHOTOGRAPHIC PURPOSES** (for photomechanical purposes G03F); **PHOTOGRAPHIC PROCESSES, E.G. CINE, X-RAY, COLOUR, 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; photomechanical production of textured or patterned surfaces G03F; electrography, electrophotography, magnetography G03G)

Note

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. **[5]**

Subclass index

1/00 **Photosensitive materials** (photosensitive materials for multicolour processes G03C 7/00; for diffusion transfer processes G03C 8/00; photosensitive glass C03C 4/00) **[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]**

1/035 . . characterised by the crystal form or composition, e.g. mixed grain **[5]**

1/04 . . with macromolecular additives; with layer-forming substances **[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

1/295 . . . 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 to 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 to G03C 1/42 **[5]**

1/46 . . having more than one photosensitive layer

1/485 . . Direct positive emulsions **[2,5]**

1/494 . Silver salt compositions other than silver halide emulsions; Photothermographic systems **[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]**

1/64 . 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 (for photopolymerisable or photocrosslinkable compositions G03F 7/028, G03F 7/038) **[5]**

1/685 . Compositions containing spiro-condensed pyran compounds or derivatives thereof, as photosensitive substances **[5]**

1/695 . Compositions containing azides as photosensitive substances (for photopolymerisable or photocrosslinkable compositions G03F 7/008) **[5]**

1/705 . Compositions containing chalcogenides, metals or alloys thereof, as photosensitive substances, e.g. photodope systems (used as photoresists G03F 7/004) **[5]**

1/72 . Photosensitive compositions not covered by groups G03C 1/005 to G03C 1/705 **[5]**

1/73 . . containing organic compounds **[5]**

1/74 . Applying photosensitive compositions to the base; Drying processes therefor (G03C 1/494 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]**

1/795 . . 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 5/08; for intensifying X-ray images G03C 5/16) **[5]**

1/825 . . characterised by antireflecting means or visible-light filtering means, e.g. anti-halation **[5]**

1/83 . . . Organic dyestuffs therefor **[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]**

1/95 . . 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, film-packs; **Wrapping materials for light-sensitive plates, films, or papers, e.g. materials characterised by the use of special dyes, printing inks, adhesives** (wrapping materials in general B65D)

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; photomechanical processes G03F) **[4,5]**

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

5/04 . Photo-taking processes

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

5/12 . Cinematographic processes of taking pictures or printing

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

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

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 5/40) **[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]**

5/50 . . 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 to 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 (images obtained by photomechanical means, e.g. by etching, G03F) **[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]**

7/14 . 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]**

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

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

7/388 . . 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]**

8/32 . Development processes or agents therefor **[5]**

8/40 . . Development by heat **[5]**

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

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

11/12 . Stripping or transferring intact photographic layers

G03D **APPARATUS FOR PROCESSING EXPOSED PHOTOGRAPHIC MATERIALS** (apparatus specially adapted for photomechanical production of textured or patterned surfaces G03F); **ACCESSORIES THEREFOR** (photosensitive materials or processes for photographic purposes G03C; electrographic, electrophotographic, or magnetographic methods or apparatus G03G)

Subclass index

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

3/06 . . Liquid supply; Liquid circulation outside tanks

3/08 . having progressive mechanical movement of exposed material

3/13 . . for long films or prints in the shape of strips, e.g. fed by roller assembly **[2]**

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; application of liquids in general B05)

7/00 **Gas processing apparatus**

9/00 **Diffusion development apparatus**

11/00 **Reversal processing apparatus**

13/00 **Processing apparatus or accessories therefor, not covered by groups G03D 3/00 to G03D 11/00**

13/02 . Containers; Holding-devices

15/00 **Apparatus for treating processed material**

15/02 . Drying; Glazing (combined with processing apparatus G03D 3/00 to G03D 13/00; drying in general F26B)

15/04 . Cutting; Splicing

17/00 **Dark-room arrangements not provided for in the other groups of this subclass**; **Portable dark-rooms**

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

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. **[5]**

1/00 **Preparation of originals for the photomechanical production of textured or patterned surfaces** (photomechanical processes in general G03F 7/00) **[3]**

1/02 . by photographic processes for production of originals simulating relief

1/04 . by montage processes

1/06 . from printing surfaces **[5]**

1/08 . Originals having inorganic imaging layers, e.g. chrome masks (G03F 1/12 takes precedence) **[5]**

1/10 . by exposing and washing out pigmented or coloured organic layers; by colouring macromolecular patterns **[5]**

1/12 . by exposing silver-halide-containing photosensitive materials or diazo-type photosensitive materials **[5]**

1/14 . Originals characterised by structural details, e.g. supports, cover layers, pellicle rings **[5]**

1/16 . Originals having apertures, e.g. for corpuscular lithography **[5]**

3/00 **Colour separation**; **Correction of tonal value** (photographic copying apparatus in general G03B)

3/10 . Checking the colour or tonal value of separation negatives or positives

5/00 **Screening processes**; **Screens therefor**

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]**

7/016 . . Diazonium salts or compounds (G03F 7/075 takes precedence) **[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]**

7/038 . . Macromolecular compounds which are rendered insoluble or differentially wettable (G03F 7/075 takes precedence; macromolecular azides G03F 7/008; macromolecular diazonium compounds G03F 7/016) **[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]**

7/11 . . . having cover layers or intermediate layers, e.g. subbing layers **[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]**

7/24 . . Curved surfaces

7/26 . Processing photosensitive materials; Apparatus therefor (G03F 7/12 to G03F 7/24 take precedence) **[3,5]**

7/28 . . for obtaining powder images (G03F 3/10 takes precedence) **[5]**

7/30 . . Imagewise removal using liquid means **[5]**

7/32 . . . Liquid compositions therefor, e.g. developers **[5]**

7/34 . . Imagewise removal by selective transfer, e.g. peeling away **[5]**

7/36 . . Imagewise removal not covered by groups G03F 7/30 to G03F 7/34, e.g. using gas streams, using plasma **[5]**

7/38 . . Treatment before imagewise removal, e.g. prebaking **[5]**

7/40 . . Treatment after imagewise removal, e.g. baking **[5]**

7/42 . . Stripping or agents therefor **[5]**

9/00 Registration or positioning of originals, masks, frames, photographic sheets or textured or patterned surfaces, e.g. automatically (G03F 7/22 takes precedence; preparation of photographic masks G03F 1/00; within photographic printing apparatus for making copies G03B 27/00) **[4]**

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]**

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)

(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. **[5]**

Subclass index

5/00 Recording-members for original recording by exposure e.g. to light, to heat, to electrons; **Manufacture thereof**; **Selection of materials therefor** (recording surfaces for measuring apparatus G01D 15/00; photosensitive materials for photographic purposes G03C)

5/02 . Charge-receiving layers (G03G 5/153 takes precedence) **[5]**

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]**

5/028 . . Layers in which after being exposed to heat patterns electrically conductive patterns are formed in the layers, e.g. for thermoxerography **[2]**

5/04 . . Photoconductive layers; Charge-generation layers or charge-transporting layers; Additives therefor; Binders therefor **[2,5]**

5/043 . . . Photoconductive layers characterised by having two or more layers or characterised by their composite structure **[5]**

5/05 . . . Organic bonding materials; Methods for coating a substrate with a photoconductive layer; Inert supplements for use in photoconductive layers **[2]**

5/06 . . . characterised by the photoconductive material being organic **[5]**

5/07 . . . . Polymeric photoconductive materials **[2]**

5/08 . . . characterised by the photoconductive material being inorganic **[2,5]**

5/082 . . . . and not being incorporated in a bonding material, e.g. vacuum deposited **[2]**

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]**

5/10 . 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]

9/08 . with toner particles **[2]**

Note

In groups G03G 9/083 to G03G 9/12, in the absence of an indication to the contrary, classification is made in the last appropriate place. **[5]**

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]**

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]**

13/06 . Developing

13/14 . Transferring a pattern to a second base

13/26 . for the production of printing plates for non-xerographic printing processes **[2]**

13/28 . . Planographic printing plates **[2]**

15/00 Apparatus for electrographic processes using a charge pattern (G03G 16/00, G03G 17/00 take precedence) **[2,5]**

Note

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]**

15/05 . 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

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

15/36 . 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 5/02); **Apparatus therefor [2,6]**

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]**

19/00 Processes using magnetic patterns; **Apparatus therefor**

21/00 Arrangements not provided for by groups G03G 13/00 to 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]**

21/10 . 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]**

G03H **HOLOGRAPHIC PROCESSES OR APPARATUS** (holograms, e.g. point holograms, used as ordinary optical elements G02B 5/32; producing stereoscopic or other three-dimensional effects G02B 27/22; diffraction-grating systems G02B 27/42; systems using moire fringes G02B 27/60; optical logic elements G02F 3/00; stereo-photography G03B 35/00; photosensitive materials or processes for photographic purposes G03C; apparatus for processing exposed photographic materials G03D; analogue computers performing mathematical operations with the aid of optical elements G06E 3/00; authentication, by radiation, of concealed information carried by holograms or diffraction gratings G06K 19/14; holographic storage G11B 7/00, G11C 13/04) **[2]**

Note

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. **[2]**

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]**

1/08 . . Synthesising holograms (using electric digital computers G06F, G06T) **[2]**

1/18 . . Particular processing of hologram record carriers, e.g. for obtaining blazed holograms **[2]**

1/20 . . Copying holograms by holographic means **[2]**

1/26 . Processes or apparatus specially adapted to produce multiple holograms or to obtain images from them, e.g. multicolour technique **[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 1/00 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 1/00 takes precedence; construction of electron microscopes H01J 37/26) **[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 7/00; structural details or housings specially adapted for electronic time-pieces with no moving parts G04G 17/00)

Note

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

Subclass index

Driving mechanisms

1/00 Driving mechanisms

Winding

3/00 Normal winding of clockworks by hand or mechanically; **Winding-up several mainsprings or driving weights simultaneously**

5/00 Automatic winding-up

7/00 Combined normal and automatic winding-up

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

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

13/00 Gearwork

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

17/00 Mechanisms for stabilising frequency [3]

18/00 Mechanisms for setting frequency [3]

Time indicating

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

19/06 . Dials (for time-pieces without clockwork G04B 49/00)

19/30 . Illumination of dials or hands

21/00 Indicating the time by acoustic means (at preselected times G04B 23/00; by electro-acoustic means G04C 21/00; sound-producing apparatus per se G10)

23/00 Arrangements producing acoustic signals at preselected times (electrically-released alarm signals G04C 21/00; metronomes G04F 5/00; sound-producing apparatus per se G10)

25/00 Indicating the time by other means or by combined means (electric or electromechanical indicating G04C)

27/00 Mechanical devices for setting the time-indicating means

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

29/00 Frameworks

31/00 Bearings; **Point suspensions or counter-point suspensions**; **Pivot bearings**; **Single parts therefor** (bearings in general F16C)

33/00 Calibers

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 (watch guards or protectors A45C 11/00; watches combined with cosmetic powder containers A45D 33/00)

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)

39/00 Watch crystals; **Fastening or sealing crystals**; **Clock glasses**

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 19/06)

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

49/00 **Time-pieces using the position of the sun, moon, or stars**

99/00 **Subject matter not provided for in other groups of this subclass [8]**

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

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; **Independent electric clocks or watches**

1/00 **Winding mechanical clocks electrically** (winding mechanically G04B 3/00)

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)

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 13/00; mechanical setting devices G04B 27/00) **[3]**

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

Electric clock installations; **Master-and-slave clock systems**; **Synchronous-motor clocks**

11/00 **Synchronisation of independently-driven clocks**

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

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) **[3]**

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

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

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 23/00; apparatus which can be set and started to measure-off predetermined intervals G04F 3/00; time or time-programme switches which automatically terminate their operation after the programme is completed H01H 43/00)

99/00 **Subject matter not provided for in other groups of this subclass [8]**

G04D APPARATUS OR TOOLS SPECIALLY DESIGNED FOR MAKING OR MAINTAINING CLOCKS OR WATCHES (machine tools in general B23, B24; hand tools in general B25)

Subclass index

1/00 Gripping, holding, or supporting devices

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

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

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

9/00 Demagnetising devices (demagnetising in general H01F 13/00)

99/00 Subject matter not provided for in other groups of this subclass [8]

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

This subclass covers:
- apparatus for measuring-off predetermined time intervals; **[2]**
- apparatus for producing such intervals as timing standards, e.g. metronomes; **[2]**
- apparatus for measuring unknown intervals, e.g. precision systems for short-time-interval measurement. **[2]**

Subclass index

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)

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)

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)

7/00 Apparatus for measuring unknown time intervals by non-electric means [2]

8/00 Apparatus for measuring unknown time intervals by electromechanical means [2]

10/00 Apparatus for measuring unknown time intervals by electric means [2]

13/00 Apparatus for measuring unknown time intervals by means not provided for in groups G04F 5/00 to G04F 10/00 [2]

G04G ELECTRONIC TIME-PIECES [3]

(1) This subclass covers:
- electronic time-pieces with no moving parts; **[3]**

– electronic circuitry for producing timing pulses irrespective of the nature of the time-indicating means utilised. **[3]**

(2) This subclass does not cover electronic time-pieces with moving parts, which are covered by subclass G04C. **[3]**

Subclass index

3/00 **Producing timing pulses** (driving circuits for stepping motors G04C 3/00; 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]**

5/00 **Setting, i.e. correcting or changing, the time-indication [3]**

7/00 **Synchronisation [3]**

9/00 **Visual time or date indication means [3]**

11/00 **Producing optical signals at preselected times [3]**

13/00 **Producing acoustic time signals [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 5/76) **[3]**

17/00 **Structural details**; **Housings [7]**

19/00 **Electric power supply circuits specially adapted for use in electronic time-pieces [7]**

21/00 ***Input or output devices integrated in time-pieces*** **[2010.01]**

99/00 ***Subject matter not provided for in other groups of this subclass*** **[2010.01]**

G05 CONTROLLING; REGULATING

(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:
- "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)

(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 : **[7]**
(a) systems for controlling or regulating non-electric variables in general, which are covered by subclass G05D; **[7]**
(b) systems for regulating electric or magnetic variables in general, which are covered by subclass G05F; **[7]**
(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. **[7]**
(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". **[7]**

General references **[7]**

A01K	73/00	Spreading or positioning of drawn nets for fishing
A61G	13/00	
A61G	15/00	Adjustable operating tables, operating chairs, or dental chairs
B01D	3/42	Distillation
B01D	24/00	
B01D	29/60	
B01D	37/00	
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	38/00	Oxygen content in oxidation gas for regeneration or reactivation of catalysts
B01J	47/00	Ion-exchange processes
B05B	12/00	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	13/00	Centrifugal casting of metals
B22D	17/32	Pressure or injection die casting of metals
B22D	18/00	Pressure or vacuum casting of metals
B22D	46/00	Casting of metals in general
B23B	39/00	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	47/00	Position of grinding tool or work
B25J	13/00	Manipulators
B26D	5/02	Position of cutters in cutting machines
B29C	39/00	
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	47/00	Addressing machines
B60G	17/00	
B60G	21/00	Vehicle suspension
B60T	7/00	
B60T	15/00	Vehicle brakes
B65B	57/00	Machines for packaging
B65G	43/00	Conveyers
E02F	3/42	Sequence of drive operations for dredging or soil-shifting
E21B	44/00	Earth drilling operations
F01K	1/00	Steam accumulators
F01K	3/00	
F01K	7/00	
F01K	13/00	Steam engine plants
F02C	7/04	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	1/00	
F02K	1/00	Jet pipes or nozzles in jet-propulsion plants
F02K	7/00	
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	59/00	
F16H	63/00	Gearings
F22B	35/00	Steam boilers
F23G	5/50	Incineration of waste
F23N		Combustion in combustion apparatus
F24B	1/00	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

Places related to group G05B 19/00 (programme-control systems) **[7]**

A61J	7/00	Programmed medicine dispensers
A61L	2/00	Disinfection or sterilising
A61N	1/36	Heart pace-makers
A63H	17/00	Steering-mechanisms for toy vehicles
B04B	13/00	Centrifuges
B21B	37/16	Thickness of work produced by metal-rolling mills
B21D	7/00	Bending metal rods, profiles, or tubes
B23B	39/00	
B23B	39/00	Boring or drilling machines
B23H	7/00	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	33/00	Sequence of operations in printing machines or presses
B41J	11/44	Feeding sheets or webs in typewriters
B41L	39/00	Sequence of operations in apparatus or devices for manifolding, duplicating or printing for commercial purposes
B41L	47/00	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	13/18	
B66C	23/00	Crane drives
B67D	7/08	Dispensing, delivering or transferring liquids
D05B	19/00	
D05B	21/00	Sewing machines
D05C	5/00	Embroidering machines
D06F	33/00	Operations in washing machines
F02D	27/00	
F02D	28/00	Combustion engines
F02D	41/00	Supply of combustible mixture or its constituents to combustion engines
F15B	21/00	Fluid-pressure actuator systems
F23N	5/20	
F23N	5/22	Combustion in combustion apparatus
G01G	19/00	Weighing apparatus
G04C	23/00	
G04C	23/00	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	7/00	Electrically or magnetically operating analogue computers
G09B	7/00	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

1/00 **Comparing elements, i.e. elements for effecting comparison directly or indirectly between a desired value and existing or anticipated values** (comparing phase or frequency of two electric signals H03D 13/00)

5/00 **Anti-hunting arrangements**

6/00 **Internal feedback arrangements for obtaining particular characteristics, e.g. proportional, integral, differential** (in automatic controllers G05B 11/00)

7/00 **Arrangements for obtaining smooth engagement or disengagement of automatic control**

9/00 **Safety arrangements** (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)

9/02 . electric

9/03 . . with multiple-channel loop, i.e. redundant control systems **[2]**

11/00 **Automatic controllers** (G05B 13/00 takes precedence)

11/01 . electric

11/32 . . with inputs from more than one sensing element; with outputs to more than one correcting element

11/36 . . with provision for obtaining particular characteristics, e.g. proportional, integral, differential

11/38 . . . for obtaining a proportional characteristic

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.

13/00 Adaptive control systems, i.e. systems automatically adjusting themselves to have a performance which is optimum according to some preassigned criterion (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]**

15/00 Systems controlled by a computer (G05B 13/00, G05B 19/00 take precedence; automatic controllers with particular characteristics G05B 11/00; computers per se G06) **[3]**

15/02 . electric

17/00 Systems involving the use of models or simulators of said systems (G05B 13/00, G05B 15/00, G05B 19/00 take precedence; analogue computers for specific processes, systems or devices, e.g. simulators, G06G 7/00) **[3]**

19/00 Programme-control systems (specific applications, see 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)

19/02 . electric

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)

19/048 . . . Monitoring; Safety **[6]**

19/05 . . . Programmable logic controllers, e.g. simulating logic interconnections of signals according to ladder diagrams or function charts **[5]**

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]**

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]**

Note

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. **[6]**

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]**

19/408 . . . 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]**

19/41 . . . 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 19/19, G05B 19/40 take precedence) **[3,6]**

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]**

21/00 Systems involving sampling of the variable controlled (G05B 13/00 to G05B 19/00 take precedence; transmission systems for measured values G08C; electronic switching or gating H03K 17/00)

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]

99/00 Subject matter not provided for in other groups of this subclass [8]

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)

(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 1/00: "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 G05D 1/00

A01B	69/00	Agricultural machines or implements
A63H	17/00	Toy vehicles
B60V	1/00	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	55/104	Chassis of endless-tracked vehicles
B63H	25/00	Marine steering; control of waterborne vessels
B64C	13/00	Controlling aircraft
B64C	15/00	
B64D	25/00	Controlling attitude or direction of aircraft ejector seats
B64G	1/24	Cosmonautic vehicles
F41G	7/00	Self-propelled missiles
F42B	15/00	Guided missiles
F42B	19/00	Marine torpedoes

Places related to G05D 3/00

A43D	119/00	Footwear manufacture
B21K	31/00	Tool carriers in forging or pressing
B23B	39/00	Pattern-controlled boring or drilling tools
B23D	1/00,	Planing or slotting machines controlled by copying device
B23D	3/00,	
B23D	5/00	
B23H	7/00	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	5/00	Spindles in machine tools
B23Q	15/00,	Tool or work position in machine tools
B23Q	16/00	
B23Q	35/00	Tools controlled by pattern or master model
B24B	17/00	Grinding controlled by patterns, drawings, magnetic tape or the like
B24B	47/00	Starting position in grinding
B30B	15/16	Actuating members in presses
B62D	55/104	Chassis of tracked vehicles
B65H	23/18	Web-advancing mechanisms

E02F	3/42	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	7/08	Movement of control elements in nuclear reactors

Places related to G05D 5/00

A24B	7/00	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	18/00	Dimension of glass ribbon
D21F	7/00	Thickness of layer in paper making

Places related to G05D 7/00

A45D	20/00	Air in hair drying helmets
A61M	5/168	Flow of media to the human body
B03C	3/34	Gases or vapour in electrostatic separators
B05C	11/10	Fluent material in coating devices
B67D	1/00	Dispensing beverages on draught
B67D	7/08	Transferring liquids
C10K	1/00	Gas purifiers
E21B	21/00	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	9/00	Gas-turbine working fluid
F16L	55/02	Throttle passages in pipes
F24F	11/00	Air-flow or supply of heating or cooling fluids in air treatment arrangements
F26B	21/06	Air or gas flow in dryers
G01G	11/00	Continuous flow weighing apparatus
G21D	3/08	Coolant in nuclear power plant

Places related to G05D 9/00

B01D	21/30	Liquid level in sedimentation arrangements
B41L	27/00	Ink level in printing, manifolding or duplicating arrangements
F22D	5/00	Feed water for boilers
H01J	1/02,	Liquid pool electrodes in electric discharge tubes or lamps
H01J	13/00	

Places related to G05D 11/00

B01D	21/30	Density in sedimentation arrangements
B01F	15/04	Mixers
B24C	7/00	Abrasive blasts
B28C	7/00	Mixtures of clays or cements
B65G	53/34	Bulk material conveyers
F02K	3/00	Flow ratio in jet-propulsion plants

Places related to G05D 13/00

B21C	1/02	Drum speed in metal drawing
B23Q	15/00	Cutting velocity of tool or work
B30B	15/16	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	31/00	Cruising speed of aircraft
D01D	1/00	Feed rate in manufacture of artificial filaments, threads, fibres, bristles or ribbons
D01G	15/00	Carding machines
D02H	13/00	Warping, beaming or leasing machines
D03D	51/00	Cyclically varying speed of looms
G01N	30/00	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 G05D 15/00

B25D	9/00	Portable percussive tools
B30B	15/16	Ram pressure in presses
B65H	59/00	Tension in filamentary material
B65H	77/00	Tension in webs, tapes, filamentary material
B66D	1/28	Rope, cable or chain tension
D03D	49/04	Tension in looms
D05B	47/00	Tension in sewing machines
D21F	3/02	Pressure in paper-making machines
F26B	13/10	Drying fabrics
F26B	21/06	Pressure in dryers
G11B	15/43	Record carrier tension in information storage arrangements

Places related to G05D 16/00

B60C	23/00	Tyre pressure
B63C	11/02	Air within diving suit
B64D	13/00	Aircraft air-pressure
B65G	53/34	Bulk material conveyers
D01D	1/00	Manufacture of artificial filaments, threads, fibres, bristles or ribbons
E21B	21/00	Flushing boreholes
F01M	1/16	Lubrication arrangements
G01N	30/00	Pressure of fluid carrier in chemical analysis
H01J	7/00	Pressure in electric discharge tubes or lamps
H01K	1/00	Pressure in electric incandescent lamps

Places related to G05D 19/00

B25D	9/00	Portable percussion tools
B65G	27/10	Jigging conveyers

Places related to G05D 21/00

B01D	21/30	Density in sedimentation arrangements
B01D	53/30	Treating gases or vapours
G01N	30/00	Composition of fluid carrier in chemical analysis

Places related to G05D 22/00

A01G	25/16	Watering gardens, fields, sports grounds or the like
A01K	41/00	Poultry incubators
A24B	9/00	Tobacco products
F24F	11/00	Air conditioning
F26B	21/06	Dryers

Places related to G05D 23/00

A21B	1/00	Bakers' ovens
A45D	6/00	Hair curlers
B21C	31/00	Metal extruding
B60C	23/00	Tyre temperature
B64G	1/46	Cosmonautic vehicles
C03B	18/00	Float baths in glass making
D01D	1/00	Manufacture of artificial filaments, threads, fibres, bristles or ribbons
D04B	35/00	Knitting machines
D06F	75/08	Hand irons
D21F	5/00	Paper-making machines
F01M	5/00	Lubricant in lubrication arrangements
F16N	7/00	Arrangements for supplying oil or unspecified lubricant from a reservoir
F22G	5/00	Steam superheat
F26B	21/06	Dryers
G01N	30/00	Temperature of fluid carrier in chemical analysis
H01M	10/42	Electric storage cells
H05B	6/06,	Dielectric, induction or microwave heating
H05B	6/00,	
H05B	6/68	
H05G	1/00	Anode of X-ray tube

Places related to G05D 25/00

B41B	21/00	Photographic composing machines
H01S	3/10,	Lasers and other light sources
H05B	33/02,	
H05B	35/00	
H05B	43/00	

General references

A01D	41/00	Combines
A01J	5/007	Milking machines
B23K	9/095	Welding parameters
B23Q	35/00	Copying
B24B	17/00,	Grinding or polishing
B24B	49/00	
B24C	7/00	Abrasive blasts
B67D	1/00	Dispensing beverages on draught
F23C	10/00	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	Dynamo-electric motors or generators
H02P	9/00	

Subclass index

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

1/08 . 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]**

3/20 . . using a digital comparing device **[3]**

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

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

7/06 . characterised by the use of electric means

9/00 **Level control, e.g. controlling quantity of material stored in vessel**

11/00 **Ratio control** (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]**

13/00 **Control of linear speed**; **Control of angular speed**; **Control of acceleration or deceleration, e.g. of a prime mover** (synchronising telegraph receiver and transmitter H04L 7/00)

15/00 **Control of mechanical force or stress**; **Control of mechanical pressure**

16/00 **Control of fluid pressure**

16/04 . without auxiliary power

16/20 . characterised by the use of electric means

17/00 **Control of torque**; **Control of mechanical power**

19/00 **Control of mechanical oscillations, e.g. of amplitude, of frequency, of phase**

21/00 **Control of chemical or physico-chemical variables, e.g. pH-value [3]**

22/00 **Control of humidity [2]**

23/00 **Control of temperature** (automatic switching arrangements for electric heating apparatus H05B 1/02)

23/01 . without auxiliary power

23/185 . with auxiliary non-electric power **[2]**

23/19 . characterised by the use of electric means

23/20 . . with sensing elements having variation of electric or magnetic properties with change of temperature (G05D 23/01 takes precedence)

23/27 . . with sensing element responsive to radiation

23/275 . . with sensing element expanding, contracting, or fusing in response to changes of temperature

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)

24/00 **Control of viscosity**

25/00 **Control of light, e.g. intensity, colour, phase** (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]**

27/00 **Simultaneous control of variables covered by two or more of main groups G05D 1/00 to G05D 25/00**

29/00 **Simultaneous control of electric and non-electric variables**

99/00 **Subject matter not provided for in other groups of this subclass [8]**

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 19/00; 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 7/08; 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 39/00, H05B 41/36; electric control of X-ray apparatus H05G 1/00) **[4,5]**

(1) 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. **[4]**

(2) This subclass does not cover elements per se, which are covered by the relevant subclasses.

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

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 7/00, H05B 31/00; automatic control of power for heating by discharge H05B 7/00) **[2]**

1/10 . Regulating voltage or current (G05F 1/02 takes precedence; for electric railways B60M 3/00)

1/66 . Regulating electric power

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

3/08 . . wherein the variable is dc

5/00 Systems for regulating electric variables by detecting deviations in the electric input to the system and thereby controlling a device within the system to obtain a regulated output

7/00 Regulating magnetic variables (details of apparatus for measuring magnetic variables involving magnetic resonance G01R 33/28) **[5]**

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 to F16H 63/00)

(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	13/00	Controls for adjusting operating tables
A61G	15/00	Controls for adjusting operating chairs
A63F	13/02	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	33/06	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	25/00	Marine steering initiating means
B66B	1/00	Controls for elevators
B66C	13/18	Control systems or devices for cranes
B66C	13/00	Arrangements of handles or pedals for crane operation

E02F	9/20		Control devices for dredging or soil shifting machines
F16C	3/04		Adjustable cranks or eccentrics
F16D	43/00		Automatic clutches
F16K	31/00,		Controls for valves
F16K	33/00		
F16P	3/00		Safety devices acting in conjunction with the control or operation of a machine
F16P	7/00		Stopping machines on occurrence of dangerous conditions therein
G02B	21/32		Micromanipulators structurally combined with microscopes
G04B	1/00	to	Driving mechanisms in clocks or watches
G04B	18/00		
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

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

Note

In this group the first place priority rule is applied, i.e. at each hierarchical level classification is made in the first appropriate place. **[2009.01]**

1/04 . Controlling members for hand-actuation by pivoting movement, e.g. levers **[1,7]**

1/30 . Controlling members actuated by foot **[2009.01]**

1/58 . Rests or guides for relevant parts of the operator's body **[2009.01]**

3/00 **Controlled members** (gear shifter yokes F16H 63/30); **Assemblies or arrangements thereof** (interlocking of controlled members G05G 5/00) **[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]**

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)

9/00 **Manually-actuated control mechanisms provided with one single controlling member co-operating with two or more controlled members, e.g. selectively, simultaneously**

11/00 **Manually-actuated control mechanisms provided with two or more controlling members co-operating with one single controlled member**

13/00 **Manually-actuated control mechanisms provided with two or more controlling members and also two or more controlled members** (interlocking G05G 5/00)

15/00 **Mechanical devices for initiating a movement automatically due to a specific cause**

17/00 **Mechanical devices for moving a member after being released**; **Trip or release mechanisms characterised thereby**

19/00 **Servo-mechanisms with follow-up action, e.g. occurring in steps**

21/00 **Mechanical apparatus for control of a series of operations, i.e. programme control, e.g. involving a set of cams** (G05G 5/00 takes precedence)

23/00 **Means for ensuring the correct positioning of parts of control mechanisms, e.g. for taking-up play**

25/00 **Other details, features or accessories of control mechanisms, e.g. supporting intermediate members elastically**

G06 COMPUTING; CALCULATING; COUNTING (score computers for games A63B 71/06, A63D 15/00, A63F 1/00; combinations of writing implements with computing devices B43K 29/00)

(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:
- 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 1/00; 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

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

1/00 Computing aids in which the computing members form at least part of the displayed result and are manipulated directly by hand, e.g. abacus, pocket adding device

3/00 Arrangements for table look-up, e.g. menstruation table

5/00 Non-functional elements

7/00 Input mechanisms (pin carriage G06C 13/00)

9/00 Transfer mechanisms, e.g. for transmitting figures from the input mechanism into the computing mechanism (G06C 7/00, G06C 11/00, G06C 15/00 take precedence)

11/00 Output mechanisms (marking record carriers in general, visual presentation in general of results of the mathematical operations G06K)

13/00 **Storage mechanisms** (mechanical counters with input only to the lowest order G06M; information storage in general G11)

15/00 **Computing mechanisms**; **Actuating devices therefor** (mechanisms for operating automatically upon more than two numbers otherwise than by repeated addition or subtraction G06C 21/00)

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**

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 15/00)

23/00 **Driving mechanisms for functional elements**

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

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

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)

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** (optical logic elements per se G02F 3/00; computer systems based on specific computational models G06N; digital storage using optical elements G11C 13/04) **[5]**

(1) This subclass covers all devices in which at least one computing function is performed by optical means. **[5]**
(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. **[5]**

1/00 **Devices for processing exclusively digital data [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; impedance networks using digital techniques H03H)

Note

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 to G06F 5/00 and G06F 9/00 to G06F 13/00.

Subclass index

1/00 **Details not covered by groups G06F 3/00 to G06F 13/00 and G06F 21/00** (architectures of general purpose stored programme computers G06F 15/76) **[1,8]**

1/02 . Digital function generators

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 (instrument details G12B) **[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 (micro-programme loading G06F 9/24; 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** (typewriters B41J; conversion of physical variables F15B 5/00, G01; image acquisition G06T 1/00, G06T 9/00; coding, decoding or code conversion, in general H03M; transmission of digital information H04L) **[4]**

3/01 . Input arrangements or combined input and output arrangements for interaction between user and computer (G06F 3/16 takes precedence) **[8]**

3/02 . . Input arrangements using manually operated switches, e.g. using keyboards or dials (keyboard switches per se H01H 13/70; electronic switches characterised by the way in which the control signals are generated H03K 17/94) **[3,8]**

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 (coding in connection with keyboards or like devices in general H03M 11/00) **[3,8]**

3/027 . . . . for insertion of the decimal point **[3,8]**

3/03 . . Arrangements for converting the position or the displacement of a member into a coded form **[3,8]**

Note

In this group, the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place. **[8]**

3/033 . . . Pointing devices displaced or positioned by the user, e.g. mice, trackballs, pens or joysticks; Accessories therefor **[3,8]**

3/041 . . . Digitisers, e.g. for touch screens or touch pads, characterised by the transducing means **[8]**

3/048 . . Interaction techniques for graphical user interfaces, e.g. interaction with windows, icons or menus **[8]**

3/05 . Digital input using the sampling of an analogue quantity at regular intervals of time (sample-and-hold arrangements G11C 27/00; sampling per se H03K 17/00; analogue/digital conversion, in general H03M 1/00)

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 (digital output to typewriter G06F 3/09; 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 (arrangements for producing a permanent visual presentation of the output data G06K 15/00; control of display in general G09G)

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 (automatic curve followers per se G06K 11/00) **[3]**

5/00 **Methods or arrangements for data conversion without changing the order or content of the data handled** (coding, decoding or code conversion, in general H03M) **[4]**

5/01 . for shifting, e.g. justifying, scaling, normalising **[5]**

5/06 . for changing the speed of data flow, i.e. speed regularising

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; information retrieval G06F 17/30; comparing pulses H03K 5/22)

7/06 . Arrangements for sorting, selecting, merging, or comparing data on individual record carriers (sorting of postal letters B07C; conveying record carriers from one station to another G06K 13/02)

7/22 . Arrangements for sorting or merging computer data on continuous record carriers, e.g. tape, drum, disc

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)

7/46 . . using electromechanical counter-type accumulators

7/48 . . using non-contact-making devices, e.g. tube, solid state device; using unspecified devices **[3]**

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]**

7/74 . 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 **[8]**

7/76 . Arrangements for rearranging, permuting or selecting data according to predetermined rules, independently of the content of the data (according to the content of the data G06F 7/06, G06F 7/22; parallel/series conversion or vice versa H03M 9/00) **[8]**

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 9/40) **[3]**

9/34 . . . Addressing or accessing the instruction operand or the result (address translation G06F 12/00) **[3,5]**

9/38 . . . Concurrent instruction execution, e.g. pipeline, look ahead **[3]**

9/40 . . Arrangements for executing subprogrammes, i.e. combinations of several instructions **[3]**

9/44 . . 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]**

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; coding, decoding or code conversion, for error detection or error correction, in general H03M 13/00) **[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 31/28) **[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]**

11/28 . by checking the correct order of processing (G06F 11/07, G06F 11/22 take precedence; monitoring patterns of pulse trains H03K 5/19) **[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; transmission of digital information in general H04L; selecting H04Q) **[4]**

13/10 . Programme control for peripheral devices (G06F 13/14 to 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 13/20 takes precedence) **[4]**

13/20 . . for access to input/output bus **[4]**

13/36 . . for access to common bus or bus system **[4]**

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 (synchronisation in transmission of digital information in general H04L 7/00) **[4]**

15/00 Digital computers in general (details G06F 1/00 to G06F 13/00); **Data processing equipment in general** (neural networks for image data processing G06T)

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]**

15/16 . 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 (interface circuits for specific input/output devices G06F 3/00; multi-programming arrangements G06F 9/46; transmission of digital information in general H04L, e.g. in computer networks H04L 12/00; selecting H04Q)

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]**

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]**

17/14 . . 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. inter- or extrapolation, smoothing, least mean square method (interpolation for numerical control G05B 19/18) **[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; systems for composing machines B41B 27/00) **[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) **[6,8]**

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) **[6,8]**

Note

This group covers: **[6]**
- special constructions of computers to permit or facilitate use in specific applications; **[6]**
- non-structural adaptations of computers to a specific application, e.g. computing methods. **[6]**

21/00 Security arrangements for protecting computers or computer systems against unauthorised activity (multiprogramming G06F 9/46; protection against unauthorised use of memory G06F 12/14; dispensing apparatus actuated by coded identity card or credit card G07F 7/08; equipment anti-theft monitoring by a central station G08B 26/00; secret or secure communication H04L 9/00; data switching networks H04L 12/00) **[8]**

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)

3/00 **Devices in which the computing operation is performed mechanically** (G06G 1/00 takes precedence)

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)

99/00 **Subject matter not provided for in other groups of this subclass [2009.01]**

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

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 7/00)

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** (postal sorting B07C; secondary surveillance radar G01S; detecting presence of transponders or tags G01S, G01V)

(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

1/00 **Methods or arrangements for marking the record carrier in digital fashion** (interpreting G06K 3/00)

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**

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

7/00 **Methods or arrangements for sensing record carriers** (G06K 9/00 takes precedence)

7/01 . Details

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 (processing or analysis of tracks of nuclear particles G01T 5/00; testing patterns on paper currency or similar valuable papers G07D 7/00; 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]**

9/26 . . 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 (image data processing or generation, in general G06T) **[3]**

Note

Group G06K 9/58 takes precedence over groups G06K 9/38 to G06K 9/54. **[3]**

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]**

9/58 . . using optical means **[3]**

9/60 . Combination of image acquisition and preprocessing functions **[3]**

9/62 . Methods or arrangements for recognition using electronic means (learning machines G06F 15/18; digital correlation G06F 17/15; analogue correlation G06G 7/00) **[3]**

9/64 . . using simultaneous comparisons or correlations of the image signals with a plurality of references, e.g. resistor matrix **[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 (optical analogue correlation G06E 3/00) **[3]**

9/78 . Combination of image acquisition and recognition functions **[3]**

9/80 . Combination of image preprocessing and recognition 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; feelers for copying devices on machine tools B23Q 35/00; arrangements for measuring areas G01B; measuring force G01L; adapted as input devices to computers G06F 3/00; systems for transmitting the position of an object with respect to a predetermined reference system, e.g. tele-autographic system, G08C 21/00) **[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 (transport devices in general B65G)

13/02 . the record carrier having longitudinal dimension comparable with transverse dimension, e.g. punched card

13/06 . . Guiding cards; Checking correct operation of card-conveying mechanisms **[2]**

13/063 . . . Aligning cards **[2]**

15/00 Arrangements for producing a permanent visual presentation of the output data [3]

15/02 . using printers (printers per se B41J)

15/12 . . by photographic printing

15/22 . using plotters (plotters per se B43L 13/00) **[3]**

17/00 Methods or arrangements for effecting co-operative working between equipments covered by two or more of main groups G06K 1/00 to 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 (record carriers adapted for controlling specific machines, see the appropriate subclass for the machine, e.g. B23Q, D03C, G10F, H04L; form printing B41; file cards B42F 19/00; record carriers in general G11)

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 1/66) **[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]**

19/18 . . . . Constructional details **[5]**

21/00 **Information retrieval from punched cards designed for manual use or handling by machine** (G06K 19/00 takes precedence); **Apparatus for handling such cards, e.g. marking or correcting**

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 11/00; computers G06C to 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

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**

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

Counting of objects

7/00 **Counting of objects carried by a conveyer**

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

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

G06N **COMPUTER SYSTEMS BASED ON SPECIFIC COMPUTATIONAL MODELS [7]**

3/00 **Computer systems based on biological models** (using neural networks for adaptive control G05B 13/00, for image pattern matching G06K 9/00, for image data processing G06T 1/20 or for phonetic pattern matching G10L 15/00; analogue computers simulating functional aspects of living beings G06G 7/00) **[7]**

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

7/00 **Computer systems based on specific mathematical models** (for adaptive control G05B 13/00) **[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 [8]**

(1) Groups G06Q 10/00 to 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. **[8]**

Group G06Q 90/00 covers systems or methods that do not involve significant data processing, when both of the following conditions are fulfilled: **[8]**

- the systems or methods are specially adapted for the purposes mentioned in the subclass title or the titles of groups G06Q 10/00 to G06Q 50/00; and **[8]**
- the systems or methods cannot be classified elsewhere in the IPC, for example by applying the principles described in paragraph 96 of the Guide. **[8]**

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". **[8]**

(2) When classifying in groups G06Q 10/00 to 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. **[8]**

(3) In this subclass, the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place. **[8]**

10/00 **Administration, e.g. office automation or reservations**; **Management, e.g. resource or project management [8]**

20/00 **Payment schemes, architectures or protocols** (apparatus for performing or posting payment transactions G07F 7/08, G07F 19/00; electronic cash registers G07G 1/12) **[8]**

Note

This group covers: **[8]**

- 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. **[8]**

30/00 **Commerce, e.g. marketing, shopping, billing, auctions or e-commerce [8]**

40/00 **Finance, e.g. banking, investment or tax processing**; **Insurance, e.g. risk analysis or pensions [8]**

50/00 **Systems or methods specially adapted for a specific business sector, e.g. health care, utilities, tourism or legal services [8]**

90/00 **Systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes, not involving significant data processing [8]**

99/00 **Subject matter not provided for in other groups of this subclass [8]**

G06T **IMAGE DATA PROCESSING OR GENERATION, IN GENERAL** (specially adapted for particular applications, see the relevant subclasses, e.g. G01C, G06K, G09G, H04N) **[6,8]**

(1) This subclass covers: **[6]**

- 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; **[6]**
- arrangements for analysing the geometric attributes of an image of an object. **[6]**

(2) This subclass does not cover: **[6]**

- photogrammetry or videogrammetry, which are covered by subclass G01C; **[8]**
- reading or recognising printed or written characters or recognising patterns, e.g. fingerprints, which is covered by subclass G06K; **[6]**
- modification of image data to allow display using multiple viewports, which is covered by subclass G09G; **[6]**
- circuits for generating functions for visual indicators, which are covered by subclass G09G; **[6]**
- scanning of documents or the like in pictorial communication, which is covered by subclass H04N. **[6]**

Subclass index

1/00 General purpose image data processing [6]

1/20 . Processor architectures; Processor configuration, e.g. pipelining (architectures of general purpose stored programme computers G06F 15/76) **[6]**

1/60 . Memory management **[6]**

3/00 Geometric image transformation in the plane of the image, e.g. from bit-mapped to bit-mapped creating a different image [6]

3/40 . Scaling of a whole image or part thereof **[6]**

5/00 Image enhancement or restoration, e.g. from bit-mapped to bit-mapped creating a similar image [6]

5/10 . by non-spatial domain filtering **[6]**

5/20 . by the use of local operators **[6]**

5/30 . . Erosion or dilatation, e.g. thinning **[6]**

5/40 . by the use of histogram techniques **[6]**

5/50 . by the use of more than one image, e.g. averaging, subtraction **[6]**

7/00 Image analysis, e.g. from bit-mapped to non bit-mapped [6]

7/20 . Analysis of motion **[6]**

7/40 . Analysis of texture **[6]**

7/60 . Analysis of geometric attributes, e.g. area, centre of gravity, perimeter, from an image **[6]**

9/00 Image coding, e.g. from bit-mapped to non bit-mapped (compression in general H03M; compression for image communication H04N) **[6]**

9/20 . Contour coding, e.g. using detection of edges **[6]**

9/40 . Tree coding, e.g. quadtree, octree **[6]**

11/00 Two dimensional (2D) image generation, e.g. from a description to a bit-mapped image [6]

11/20 . Drawing from basic elements, e.g. line, circle, chart **[6]**

11/40 . Filling a planar surface, i.e. by adding colour or texture **[6]**

11/60 . Editing figures and text; Combining figures or text **[6]**

11/80 . Creating or modifying a manually drawn or painted image using a manual input device, e.g. mouse, light pen, direction keys on keyboard **[6]**

13/00 Animation effects in two dimensional (2D) images, e.g. using sprites [6]

15/00 Three dimensional (3D) image rendering, e.g. from a model to a bit-mapped image [6]

15/10 . Geometric effects **[6]**

15/50 . Lighting effects, e.g. shading **[6]**

15/70 . Animation effects **[6]**

17/00 Three dimensional (3D) modelling, e.g. data description of 3D objects [6]

17/10 . Constructive solid geometry (CSG) using solid primitives, e.g. cylinders, cubes **[6]**

17/20 . Finite element generation, e.g. wire-frame surface description **[6]**

17/30 . Polynomial surface description **[6]**

17/40 . Manipulating 3D images, e.g. using CAD graphics workstations **[6]**

17/50 . Geographic models **[6]**

G07 CHECKING-DEVICES

G07B TICKET-ISSUING APPARATUS; FARE-REGISTERING APPARATUS; FRANKING APPARATUS

Subclass index

1/00 **Machines for printing and issuing tickets** (printing mechanisms per se B41; output mechanisms of digital computers G06C 11/00)

1/02 . employing selectable printing plates

1/06 . without selectable printing plates

1/08 . portable

3/00 **Machines for issuing preprinted tickets**

5/00 **Details of, or auxiliary devices for, ticket-issuing machines** (for validating inserted tickets G07B 11/00)

5/04 . for recording or registering tickets issued

7/00 **Holders providing direct manual access to the tickets**

9/00 **Ticket punches** (perforating pliers B26F 1/32; marking record carriers in digital fashion by punching G06K 1/00)

11/00 **Apparatus for validating or cancelling issued tickets [2]**

13/00 **Taximeters** (measuring distance travelled G01C; measuring time G04)

15/00 **Arrangements or apparatus for collecting fares, tolls, or entrance fees at a control point** (coin-handling aspects G07D; vending or hiring apparatus actuated by tokens or tickets G07F 7/00, G07F 17/00)

15/02 . with provision for taking into account a variable factor such as distance or time, e.g. for passenger transport

17/00 **Franking apparatus** (printing aspects B41)

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

1/00 **Registering, indicating, or recording the time of events or elapsed time, e.g. time-recorders for work people** (registering or indicating the working of machines or vehicles G07C 3/00, G07C 5/00; together with the recording of a continuously-varying variable G01D or the appropriate other subclass of class G01, dependent on the variable)

3/00 **Registering or indicating the condition or the working of machines or other apparatus, other than vehicles** (engine indicators G01L; testing apparatus incident to its manufacture G01M; signalling arrangements per se, indicating undesired or abnormal working conditions G08B)

5/00 **Registering or indicating the working of vehicles** (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)

7/00 **Details or accessories common to the registering or indicating apparatus of groups G07C 3/00 and G07C 5/00**

9/00 **Individual entry or exit registers**

9/02 . Turnstiles with registering means (coin-freed aspects G07F)

11/00 **Arrangements, systems, or apparatus for checking, e.g. the occurrence of a condition, not provided for elsewhere** (for checking lottos or bingo games A63F 3/06; signalling or alarm arrangements G08B)

13/00 **Voting apparatus**

15/00 **Generating random numbers**; **Lottery apparatus** (digital computer arrangements for generating random or pseudo-random numbers G06F 7/58; generating electric pulses at random intervals H03K 3/00) **[3]**

G07D **SORTING, TESTING, CHANGING, DELIVERING, OR OTHERWISE HANDLING COINS**; **TESTING OR CHANGING PAPER CURRENCY**; **TESTING SECURITIES, BONDS, OR SIMILAR VALUABLE PAPERS** (sorting in general B07C) **[2]**

Note

In this subclass, the following term is used with the meaning indicated:
– "coins" covers also tokens or the like.

1/00 **Coin deliverers**

1/02 . giving change (coin-actuated mechanisms in general G07F)

3/00 **Apparatus separating a mixed bulk of currency into its denominations** (sorting by coin weight G01G) **[1,7]**

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** (apparatus separating a mixed bulk of currency into its denominations G07D 3/00) **[1,7]**

7/00 **Testing paper currency, securities, bonds, or similar valuable papers for genuineness** (methods or arrangements for verifying the correctness of markings on a record carrier G06K 5/00) **[2]**

9/00 **Devices for facilitating the handling of coins, not provided for in groups G07D 1/00 to G07D 5/00, G07D 11/00 or G07D 13/00** (of paper currency B65H); **Devices for counting coins** (counting by weighing G01G; counting paper currency G06M)

9/02 . Change trays

9/04 . Hand- or motor-driven devices for counting coins (counting mechanisms in general G06M)

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 currencies, e.g. depositing machines** (coin-freed or like apparatus G07F, e.g. complete banking systems G07F 19/00) **[5]**

13/00 **Handling coins or paper currencies characterised by a combination of mechanisms not covered by a single one of groups G07D 1/00 to G07D 11/00** (handling coins or paper currencies in combination with coin-freed or like apparatus G07F) **[5]**

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

(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

1/00 **Coin inlet arrangements**; **Coins specially adapted to operate coin-freed mechanisms** (coins in general A44C)

5/00 **Coin-actuated mechanisms**; **Interlocks**

5/20 . specially adapted for registering coins as credit, e.g. mechanically actuated

7/00 **Mechanisms actuated by objects other than coins to free or to actuate vending, hiring, coin or paper currency dispensing or refunding apparatus** (complete banking systems G07F 19/00; handling coins or paper currencies apart from coin-freed or like apparatus G07D) **[2]**

7/08 . by coded identity card or credit card **[2]**

7/10 . . together with a coded signal **[2]**

7/12 . . Card verification **[5]**

9/00 **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)

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 15/00)

9/04 . Means for returning surplus or unused coins

9/06 . Coin boxes

9/08 . Counting total of coins inserted

9/10 . Casings, e.g. with means for heating or cooling

11/00 **Coin-freed apparatus for dispensing, or the like, discrete articles**

11/02 . from non-movable magazines

11/04 . . in which magazines the articles are stored one vertically above the other

11/16 . . . Delivery means

11/46 . from movable storage containers or supports

11/70 . in which the articles are formed in the apparatus from components, blanks, or material constituents

13/00 **Coin-freed apparatus for controlling dispensing of fluids, semiliquids or granular material from reservoirs**

13/06 . with selective dispensing of different fluids or materials or mixtures thereof

13/10 . with associated dispensing of containers, e.g. cups or other articles (dispensing discrete articles per se G07F 11/00)

15/00 **Coin-freed apparatus with meter-controlled dispensing of liquid, gas, or electricity** (tariff-metering apparatus in general G01D 4/00)

17/00 **Coin-freed apparatus for hiring articles**; **Coin-freed facilities or services** (picture juke-boxes G03B; prepayment telephone systems H04M 17/00)

17/10 . for means for safe-keeping of property, left temporarily, e.g. by fastening the property

17/32 . for games, toys, sports, or amusements

19/00 **Complete banking systems**; **Coded card-freed arrangements adapted for dispensing or receiving monies or the like and posting such transactions to existing accounts, e.g. automatic teller machines** (mechanisms in general actuated by objects other than coins G07F 7/00; data processing equipment for bank accounting G06Q 40/00; handling coins or paper currencies apart from coin-freed or like apparatus G07D) **[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]**

1/10 . 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 (indicating or display devices per se G09F; transmission of pictures H04N)

G08B **SIGNALLING OR CALLING SYSTEMS**; **ORDER TELEGRAPHS**; **ALARM SYSTEMS** (signalling arrangements on vehicles B60Q, B62D 41/00; railway signalling systems or devices B61L; on cycles B62J 3/00, B62J 6/00; safes or strong-rooms with alarm devices E05G; signalling or alarm devices in mines E21F 17/00; sensitive measuring elements, see the appropriate subclasses of G01; traffic control systems G08G; visual indicating means G09; sound-producing devices G10; radio or near-field calling systems H04B 5/00, H04B 7/00; loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers H04R)

(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

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

3/00 **Audible signalling systems**; **Audible personal calling systems** (audible indication of time signals G04B 21/00, G04C 21/00)

5/00 **Visible signalling systems, e.g. personal calling systems, remote indication of seats occupied** (display of time signals G04B 19/00, G04C 17/00, G04C 19/00, G04G 9/00; for display of alphanumeric information G09F; flags, banners G09F)

5/22 . using electric transmission; using electromagnetic transmission

6/00 **Tactile signalling systems, e.g. personal calling systems** (indication of time by feeling G04B 25/00; deaf-aid sets H04R 25/00) **[6]**

7/00 **Signalling systems according to more than one of groups G08B 3/00 to G08B 6/00** (combinations of display arrangements with audible advertising G09F 27/00); **Personal calling systems according to more than one of groups G08B 3/00 to G08B 6/00**

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** (signalling devices in mines E21F 17/00)

13/00 **Burglar, theft, or intruder alarms** (vehicle theft alarms B60R 25/10; cycle theft alarms B62H 5/00)

13/02 . Mechanical actuation

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

13/189 . . using passive radiation detection systems **[5]**

13/194 . . . using image scanning and comparing systems **[5]**

13/22 . Electrical actuation

13/24 . . by interference with electromagnetic field distribution

15/00 **Identifying, scaring, or incapacitating burglars, thieves, or intruders, e.g. by explosives** (burglar traps, or the like, on safes E05G 5/00)

17/00 **Fire alarms**; **Alarms responsive to explosion** (temperature-responsive elements G01K)

17/02 . Mechanical actuation of the alarm, e.g. by the breaking of a wire

17/04 . Hydraulic or pneumatic actuation of the alarm, e.g. by change of fluid pressure

17/06 . Electric actuation of the alarm, e.g. using a thermally-operated switch (thermally-operated electric switches per se H01H 37/00)
17/08 . Actuation involving the use of explosive means
17/10 . Actuation by presence of smoke or gases
17/103 . . using a light emitting and receiving device **[5]**
17/12 . Actuation by presence of radiation or particles, e.g. of infra-red radiation, of ions

19/00 Alarms responsive to two or more different undesired or abnormal conditions, e.g. burglary and fire, abnormal temperature and abnormal rate of flow

21/00 Alarms responsive to a single specified undesired or abnormal condition and not otherwise provided for

23/00 Alarms responsive to unspecified undesired or abnormal conditions

25/00 Alarm systems in which the location of the alarm condition is signalled to a central station, e.g. fire or police telegraphic systems
25/01 . characterised by the transmission medium **[5]**
25/08 . . using communication transmission lines (telephonic communication systems combined with alarm systems H04M 11/04) **[5]**
25/10 . . using wireless transmission systems **[5]**
25/12 . Manually actuated calamity alarm transmitting arrangements **[5]**
25/14 . Central alarm receiver or annunciator arrangements **[5]**

26/00 Alarm systems in which substations are interrogated in succession by a central station

27/00 Alarm systems in which the alarm condition is signalled from a central station to a plurality of substations

29/00 Checking or monitoring of signalling or alarm systems; **Prevention or correction of operating errors, e.g. preventing unauthorised operation**

31/00 Predictive alarm systems characterised by extrapolation or other computation using updated historic data [5]

G08C TRANSMISSION SYSTEMS FOR MEASURED VALUES, CONTROL OR SIMILAR SIGNALS (fluid pressure transmission systems F15B; sensing members for specific physical variables, see the relevant subclasses, e.g. of G01, of H01; indicators or recorders, see the relevant subclasses, e.g. G01D, G09F; mechanical means for transferring the output of a sensing member into a different variable G01D 5/00; self-balancing bridges G01R; position control in general G05D 3/00; mechanical control systems G05G; systems for transmitting "on/off" signals only, systems for transmitting alarm conditions G08B; order telegraph systems G08B 9/00; generating electric pulses H03K; coding, decoding or code conversion, in general H03M; transmission of digital information H04L; selective calling from one station to another H04Q 9/00) **[4]**

Subclass index

13/00 Arrangements for influencing the relationship between signals at input and output, e.g. differentiating, delaying (transferring the output of a sensing member to measuring arrangements giving results not yielding momentary value G01D 1/00; systems for control of position involving comparison between actual and desired values G05D 3/00; computing in general G06)

15/00 Arrangements characterised by the use of multiplexing for the transmission of a plurality of signals over a common path (multiplex transmission in general H04J)

17/00 Arrangements for transmitting signals characterised by the use of a wireless electrical link [6]

19/00 Electric signal transmission systems (G08C 17/00 takes precedence)
19/02 . in which the signal transmitted is magnitude of current or voltage (G08C 19/36, G08C 19/38 take precedence)
19/12 . in which the signal transmitted is frequency or phase of ac
19/16 . in which transmission is by pulses
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)
19/36 . using optical means to convert the input signal (analogue/digital conversion per se H03M 1/00)
19/38 . using dynamo-electric devices (operated by pulses G08C 19/16; dynamo-electric machines per se H02K)

21/00 Systems for transmitting the position of an object with respect to a predetermined reference system, e.g. tele-autographic system (converting the pattern of mechanical parameters, e.g. force or presence, into electrical signals G06K 11/00) **[5]**

23/00 Non-electric signal transmission systems, e.g. optical systems

25/00 Arrangements for preventing or correcting errors; **Monitoring arrangements**

G08G **TRAFFIC CONTROL SYSTEMS** (guiding railway traffic, ensuring the safety of railway traffic B61L; arrangement of road signs or traffic signals E01F 9/00; radar systems or analogous systems, designed for traffic control G01S 13/00; sonar or lidar systems specially designed for traffic control G01S 15/00, G01S 17/00) **[2]**

Note

This subclass covers:
- identification of traffic offenders;
- indicating the position of vehicles for traffic control purposes; **[7]**
- 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; **[7]**
- indication of free spaces in parking areas.

1/00 **Traffic control systems for road vehicles**

1/005 . including pedestrian guidance indicator **[5]**

1/01 . Detecting movement of traffic to be counted or controlled (G08G 1/07 to G08G 1/14 take precedence)

1/015 . . with provision for distinguishing between motor cars and cycles

1/017 . . identifying vehicles (G08G 1/015, G08G 1/052 take precedence) **[5]**

1/02 . . using treadles built into the road (pads or other sensitive devices responsive to passage of vehicles E01F 11/00)

1/04 . . using optical or ultrasonic detectors

1/042 . . using inductive or magnetic detectors **[5]**

1/048 . . with provision for compensation of environmental or other condition, e.g. snow, vehicle stopped at detector **[5]**

1/052 . . with provision for determining speed or overspeed **[5]**

1/056 . . with provision for distinguishing direction of travel **[5]**

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

1/07 . Controlling traffic signals

1/09 . Arrangements for giving variable traffic instructions (indicating arrangements for variable information by selection or combination of individual elements G09F 9/00)

1/095 . . Traffic lights

1/096 . . provided with indicators in which a mark progresses showing the time elapsed, e.g. of green phase

1/0962 . . having an indicator mounted inside the vehicle, e.g. giving voice messages **[5]**

1/0968 . . . Systems involving transmission of navigation instructions to the vehicle **[5]**

1/0969 . . . . having a display in the form of a map **[5]**

1/097 . Supervising of traffic control systems, e.g. by giving an alarm if two crossing streets have green light simultaneously

1/123 . indicating the position of vehicles, e.g. scheduled vehicles (transmission of navigation instructions to vehicles G08G 1/0968) **[5]**

1/127 . . to a central station **[5]**

1/14 . indicating individual free spaces in parking areas

1/16 . Anti-collision systems (road vehicle drive control systems for predicting or avoiding probable or impending collision otherwise than by control of a particular sub-unit B60W 30/08) **[2,8]**

3/00 **Traffic control systems for marine craft** (marking of navigational route B63B 22/00, B63B 51/00)

5/00 **Traffic control systems for aircraft** (landing aids fitted in or to aircraft B64D 45/00; visual or acoustic landing aids B64F 1/00) **[2]**

7/00 **Traffic control systems for simultaneous control of two or more different kinds of craft [2]**

9/00 **Traffic control systems for craft where the kind of craft is irrelevant or unspecified [2]**

99/00 **Subject matter not provided for in other groups of this subclass [8]**

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 (devices for psychotechnics or for testing reaction times A61B 5/16; games, sports, amusements A63; projectors, projector screens G03B)

(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

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** (puzzle-games A63F 9/00; advertising or displaying in general G09F)

3/00 **Manually- or mechanically-operated teaching appliances working with questions and answers** (electrically-operated G09B 7/00; advertising or displaying in general G09F)

5/00 **Electrically-operated educational appliances** (working with questions and answers G09B 7/00; simulators G09B 9/00; advertising or displaying in general G09F) **[2]**

7/00 **Electrically-operated teaching apparatus or devices working with questions and answers** (mechanically-operated G09B 3/00; computing arrangements G06F)

9/00 **Simulators for teaching or training purposes** (for the use of weapons F41; computing aspects G06)

9/02 . for teaching control of vehicles or other craft

9/04 . . for teaching control of land vehicles

9/54 . Simulation of radar (G09B 9/02 takes precedence) **[5]**

9/56 . Simulation of sonar **[5]**

11/00 **Teaching hand-writing, shorthand, drawing, or painting**

13/00 **Teaching typing**

15/00 **Teaching music** (metronomes G04F 5/00)

15/02 . Boards or like means for providing an indication of notes

17/00 **Teaching reading** (teaching lip-reading G09B 21/00)

19/00 **Teaching not covered by other main groups of this subclass** (teaching or practice apparatus for gun-aiming or gun-laying F41G 3/00)

19/02 . Counting; Calculating (abacus G06C 1/00)

19/04 . Speaking (with audible presentation of the material to be studied G09B 5/00)

19/06 . Foreign languages (with audible presentation of the material to be studied G09B 5/00)

19/10 . Modelling

19/24 . Use of tools

21/00 **Teaching, or communicating with, the blind, deaf or mute** (audible presentation of material to be studied G09B 5/00; devices or methods for replacing direct visual or auditory perception by another kind of perception A61F 9/08, A61F 11/00; audible indication of meter readings or of colour G01D 7/12; watches for blind persons G04B 25/00; methods or arrangements for reading or recognising printed or written characters G06K 9/00; speech analysis, speech recognition G10L; sound-recording or reproducing, per se G11B) **[2,4]**

23/00 **Models for scientific, medical, or mathematical purposes, e.g. full-sized device for demonstration purposes** (in the nature of toys A63H; for surveying G09B 25/00)

25/00 **Models for purposes not provided for in group G09B 23/00, e.g. full-sized devices for demonstration purposes** (model vehicles, tracks therefor, models in the nature of toys A63H; for stage purposes A63J 1/00)

27/00 **Planetaria**; **Globes**

29/00 **Maps**; **Plans**; **Charts**; **Diagrams, e.g. route diagram** (star maps G09B 27/00; devices for holding or supporting maps A47B 97/00; for computing purposes G06G 1/00; display boards G09F)

29/02 . sectional

29/06 . of belt form, e.g. endless belt

29/08 . Hanging maps or the like

29/10 . Map spot or co-ordinate position indicators; Map-reading aids (optical projection apparatus G03B)

29/12 . Relief maps (relief models G09B 25/00)

29/14 . Local-time charts

G09C **CIPHERING OR DECIPHERING APPARATUS FOR CRYPTOGRAPHIC OR OTHER PURPOSES INVOLVING THE NEED FOR SECRECY** (secret communication H04K; arrangements for transmitting secret digital information H04L 9/00)

1/00 **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** (cryptographic typewriters G09C 3/00)

1/02 . by using a ciphering code in chart form

1/04 . 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

1/06 . 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

3/00 **Typewriters for ciphering or deciphering cryptographic text** (marking record carriers G06K)

5/00 **Ciphering 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** (calendar blocks B42D 5/00; clockwork-driven G04B; comprising computing means G06C)

1/00 **Railway or like time or fare tables**; **Indicating or reading aids therefor** (essentially incorporating maps or route diagrams G09B; railway routing charts G09B; display devices, e.g. railway indicator boards, G09F)

3/00 **Perpetual calendars**

G09F **DISPLAYING**; **ADVERTISING**; **SIGNS**; **LABELS OR NAME-PLATES**; **SEALS** (display cases A47F; designs or pictures characterised by special or unusual light effects, e.g. changing, B44F 1/00; disposition of road signs or traffic signals E01F 9/00; lighting in general F21; arrangements for controlling light beams G02F 1/00; visible signalling arrangements or devices G08B 5/00; traffic control systems G08G; arrangements or circuits for control of indicating devices using static means to present variable information G09G; static indicating arrangements comprising integral associations of a plurality of light sources H01J, H01K, H01L, H05B 33/12)

(1) 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. **[3]**

(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". **[7]**

Subclass index

1/00 **Cardboard or like show-cards of foldable or flexible material**

3/00 **Labels, tag tickets, or similar identification or indication means** (medals or badges A44C 3/00; making labels B31D 1/00; sheets temporarily attached together B42F; labelling B65C; tags attached to, or associated with, an object, in order to enable detection of the object G01V 15/00; labels on record carriers G11B 23/38); **Seals**; **Postage or like stamps**

3/02 . Forms or constructions (layered products B32B)

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)

3/08 . Fastening or securing by means not forming part of the material of the label itself

3/10 . . by an adhesive layer

5/00 **Means for displaying samples**

7/00 **Signs, name or number plates, letters, numerals, or symbols** (vehicle registration number plates B60R 13/00); **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

7/18 . Means for attaching signs, plates, panels, or boards to a supporting structure

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; light guides G02B 6/00; abacus G06C 1/00; slide rules G06G 1/00)

9/30 . in which the desired character or characters are formed by combining individual elements (panels comprising a number of electrodes in a single cell controlling light arriving from an independent light source, e.g. electro-optical or magneto-optical cell, G02F 1/00)

9/302 . . characterised by the form or geometrical disposition of the individual elements **[7]**

9/307 . . being incandescent filaments (G09F 9/302 takes precedence; incandescent panels comprising a number of separate incandescent bodies, per se H01K 9/00) **[3,7]**

9/313 . . being gas discharge devices (G09F 9/302 takes precedence; gas discharge panels comprising a number of discharge gaps, per se H01J 17/49) **[3,7]**

9/33 . . being semiconductor devices, e.g. diodes (G09F 9/302 takes precedence; semiconductor integrated circuits comprising components specially adapted for emission of light, per se H01L 27/15) **[3,7]**

9/35 . . being liquid crystals (G09F 9/302 takes precedence; liquid crystal materials C09K 19/00) **[3,7]**

9/37 . . being movable elements (G09F 9/302 takes precedence) **[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** (using static means to present variable information G09F 9/00; showcases or show-cabinets with arrangements for continuously or intermittently moving the merchandise A47F 3/00)

13/00 **Illuminated signs**; **Luminous advertising** (G09F 9/00, G09F 11/00 take precedence; control of displays in general using static means to present variable information G09G)

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 (backlighting of liquid crystal display panels G02F 1/13)

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 (luminescent materials C09K 11/00; light sources using luminescence F21K 2/00)

13/22 . . electroluminescent (electroluminescent light sources per se H05B 33/00)

15/00 **Boards, hoardings, pillars, or like structures for notices, placards, posters, or the like**

17/00 **Flags**; **Banners**; **Mountings therefor** (devices specially adapted or mounted for storing and repeatedly paying-out and re-storing lengths of material B65H 75/34)

19/00 **Advertising or display means not otherwise provided for**

19/12 . using special optical effects (designs or pictures characterised by special light effects B44F 1/00, e.g. changing pictures B44F 1/00)

19/22 . Advertising or display means on roads, walls, or similar surfaces, e.g. illuminated (illuminated signs in general G09F 13/00)

21/00 **Mobile visual advertising**

23/00 **Advertising on or in specific articles, e.g. ashtrays, letter-boxes** (on or in vehicles G09F 21/00; containers, packaging-elements, or packages, with auxiliary means or provisions for displaying articles B65D)

25/00 **Audible advertising** (sound-recording or reproducing in general G11B; public address systems H04R 27/00)

27/00 **Combined visual and audible advertising or displaying, e.g. for public address**

G09G **ARRANGEMENTS OR CIRCUITS FOR CONTROL OF INDICATING DEVICES USING STATIC MEANS TO PRESENT VARIABLE INFORMATION** (lighting in general F21; arrangements for displaying electric variables or waveforms G01R 13/00; devices or arrangements for the control of light beams G02F 1/00; indicating of time by visual means G04B 19/00, G04C 17/00, G04G 9/00; arrangements for transferring data between computers and peripheral equipment G06F 3/00; visible signalling arrangements or devices G08B 5/00; traffic control systems G08G; display, advertising, signs G09F, e.g. 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; circuits in pulse counters for indicating the result H03K 21/00; coding, decoding or code conversion, in general H03M; reproducing a picture or pattern using electric signals representing parts thereof and produced by scanning an original H04N) **[3,4,5]**

(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. **[3]**

(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]**

(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. **[3]**

(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. **[3]**

1/00 **Control arrangements or circuits, of interest only in connection with cathode-ray tube indicators** (cathode-ray oscilloscopes G01R 13/20; television H04N) **[3]**

1/02 . Storage circuits (G09G 1/06 to G09G 1/28 take precedence) **[3]**

1/04 . Deflection circuits **[3]**

1/06 . using single beam tubes (G09G 1/26, G09G 1/28 take precedence) **[3]**

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]**

1/16 . . . the pattern of rectangular co-ordinates extending over the whole area of the screen, i.e. television type raster **[3]**

1/20 . using multi-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]**

1/24 . using tubes permitting selection of individual elements forming in combination a character **[3]**

1/26 . using storage tubes **[3]**

1/28 . using colour tubes **[3]**

3/00 **Control arrangements or circuits, of interest only in connection with visual indicators other than cathode-ray tubes** (optical scanning systems in general G02B 26/10) **[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]**

3/16 . . by control of light from an independent source **[3]**

3/18 . . . using liquid crystals **[3]**

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]**

3/28 . . . using luminous gas-discharge panels, e.g. plasma **[3]**

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]**

5/00 **Control arrangements or circuits for visual indicators common to cathode-ray tube indicators and other visual indicators** (image data processing or generation, in general G06T) **[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]**

5/38 . . with means for controlling the display position **[5]**

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

(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

G10B ORGANS; HARMONIUMS OR LIKE WIND-ACTUATED MUSICAL INSTRUMENTS (mouth organs G10D 7/00; accordions G10D 11/00; aspects of automatic actuation G10F 1/00; combinations of microphones, pick-ups or amplifiers with musical instruments G10H; electronic organs G10H 7/00)

1/00 General design

3/00 Details or accessories

G10C PIANOS, HARPSICHORDS, SPINETS OR SIMILAR STRINGED MUSICAL INSTRUMENTS WITH ONE OR MORE KEYBOARDS (non-musical aspects of toy pianos A63H 5/00; aspects of automatic actuation G10F; combinations of microphones, pick-ups or amplifiers with musical instruments G10H)

1/00 General design

3/00 **Details or accessories**

3/12 **.** Keyboards; Keys

5/00 **Combinations with other musical instruments, e.g. with bells or xylophones**

9/00 **Methods or tools specially adapted for the manufacture or maintenance of musical instruments covered by this subclass**

G10D **STRINGED MUSICAL INSTRUMENTS**; **WIND-ACTUATED MUSICAL INSTRUMENTS**; **ACCORDIONS OR CONCERTINAS**; **PERCUSSION MUSICAL INSTRUMENTS**; **MUSICAL INSTRUMENTS NOT OTHERWISE PROVIDED FOR** (automatic musical instruments G10F; combinations of musical instruments with microphones, pick-ups or amplifiers G10H; sound-producing devices not regarded as musical instruments G10K)

(1) This subclass covers certain stringed musical instruments that can optionally include a keyboard, e.g. zithers. **[2010.01]**

(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. **[2010.01]**

1/00 **General design of stringed musical instruments, e.g. violins, harps, mandolins, guitars, banjos or zithers**

3/00 **Details of, or accessories for, stringed musical instruments, e.g. slide-bars**

7/00 **General design of wind-actuated musical instruments, e.g. flutes, ocarinas, oboes, clarinets, bagpipes, saxophones, trumpets or mouth-organs** (accordions or concertinas G10D 11/00; organs or harmoniums G10B; whistles G10K)

9/00 **Details of, or accessories for, wind-actuated musical instruments**

11/00 **Accordions, concertinas or the like**; **Keyboards therefor**

13/00 **Percussion musical instruments, e.g. drums, tambourines, timpani, castanets, cymbals, triangles, gongs or plates**; **Details or accessories**

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 toy instruments A63H 5/00; sound-recording or reproducing G11B; working in association with recording or reproducing apparatus G11B 31/02)

Note

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**

3/00 **Independent players for keyboard instruments**

5/00 **Details or accessories**

G10G **AIDS FOR MUSIC** (teaching music G09B 15/00); **SUPPORTS FOR MUSICAL INSTRUMENTS**; **OTHER AUXILIARY DEVICES OR ACCESSORIES FOR MUSIC OR MUSICAL INSTRUMENTS** (metronomes G04F 5/00)

1/00 **Means for the representation of music**

3/00 **Recording music in notation form, e.g. recording the mechanical operation of a musical instrument**

5/00 **Supports for musical instruments**

7/00 **Other auxiliary devices or accessories, e.g. conductors' batons or separate holders for resin or strings**

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

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

1/053 . . . 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

1/18 . 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]**

1/32 . 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 5/00) **[3]**

1/44 . Tuning means **[3]**

1/46 . Volume control **[3]**

3/00 **Instruments in which the tones are generated by electromechanical means**

5/00 **Instruments in which the tones are generated by means of electronic generators** (G10H 7/00 takes precedence) **[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]**

7/08 . by calculating functions or polynomial approximations to evaluate amplitudes at successive sample points of a tone waveform **[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]

(1) This subclass covers arrangements for generating mechanical vibrations in fluids. **[6]**

(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: **[6]**

– "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. **[6]**

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 13/00; automatic carillons G10F 1/00)

3/00 **Rattles or like noise-producing devices**

5/00 **Whistles**

7/00 **Sirens**

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)

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**

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]**

15/08 . Arrangements for producing a reverberation or echo sound **[5]**

G10L SPEECH ANALYSIS OR SYNTHESIS; SPEECH RECOGNITION; AUDIO ANALYSIS OR PROCESSING [4]

Note

This subclass does not cover :
- *devices for the storage of speech or audio signals, which are covered by subclasses G11B and G11C;* **[2010.01]**
- *encoding of compressed speech signals for transmission or storage, which is covered by group H03M 7/30.* **[2010.01]**

11/00 Determination or detection of speech or audio characteristics not restricted to a single one of groups G10L 15/00 to G10L 21/00 [7]

13/00 Speech synthesis; Text to speech systems [7]

15/00 Speech recognition (G10L 17/00 takes precedence) **[7]**

17/00 Speaker identification or verification [7]

19/00 Speech or audio signal analysis-synthesis techniques for redundancy reduction, e.g. in vocoders; Coding or decoding of speech or audio signals, e.g. for compression or expansion, source-filter models or psychoacoustic analysis [7]

21/00 Processing of the speech 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; speech to text systems G10L 15/00) **[7]**

23/00 Speech analysis not provided for in other groups of this subclass [2009.01]

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 1/00; circuits for coupling output of reproducer to radio receiver H04B 1/20; gramophone pick-ups or like acoustic electromechanical transducers or circuits therefor H04R)

(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; **[7]**
- "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. **[7]**

(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". **[7]**

Subclass index

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)

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

Groups G11B 5/02 to G11B 5/86 take precedence over groups G11B 5/004 to G11B 5/012. **[2]**

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]**

5/02 . 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]**

5/127 . 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]**
5/17 . . 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 to G11B 5/255) **[4]**
5/33 . . Structure or manufacture of flux-sensitive heads (general details therefor G11B 5/133 to G11B 5/255) **[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

This group does not cover compositions, materials or processes, per se, which are covered by the relevant subclasses of section B or C. **[4]**

5/64 . . comprising only the magnetic material without bonding agent
5/66 . . . the record carriers consisting of several layers
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]**
5/716 . . . . characterised by two or more magnetic layers **[4]**
5/72 . . Protective coatings, e.g. anti-static
5/74 . Record carriers characterised by the form, e.g. sheet shaped to wrap around a drum
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]**
5/852 . . 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]**
7/007 . 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 (modulating by information signals G11B 7/12) **[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

7/125 . . Optical beam sources therefor; Modulators, e.g. means for controlling the size or intensity of the optical spot or of the optical trace **[4]**

7/13 . . Optical detectors therefor **[4]**

7/135 . . Means for guiding the beam from source to record carrier or from record carrier to detector **[4]**

7/14 . . adapted to record on, or to reproduce from, more than one track simultaneously (G11B 7/20 takes precedence)

7/16 . . using filters, e.g. colour filter

7/18 . . using optical slits

7/20 . . Dual-recording arrangements, i.e. in which the information is recorded in two different forms simultaneously on the same or related tracks, e.g. recording instantaneous and mean values (sound-recording combined with cinematography G03C 5/12)

7/22 . . Apparatus or processes specially adapted for the manufacture of heads, e.g. assembly

7/24 . Record carriers characterised by the selection of the material or by the structure or form (characterised by the arrangement of information on the carrier G11B 7/007) **[4]**

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

9/00 Recording or reproducing using a method or means not covered by one of the main groups G11B 3/00 to G11B 7/00; **Record carriers therefor** (G11B 11/00 takes precedence) **[4]**

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 to G11B 7/00 or by different subgroups of group G11B 9/00; **Record carriers therefor**

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]**

(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. **[7]**

(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. **[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 to 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]**

15/087 . . . by sensing recorded signals **[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

15/16 . . by sensing presence, absence or position of record carrier or container

15/18 . Driving; Starting; Stopping; Arrangements for control or regulation thereof

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

15/43 . . 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

15/60 . 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

15/66 . . Threading; Loading; Automatic self-loading

15/665 . . . by extracting loop of record carrier from container **[4]**
15/675 . Guiding containers **[4]**
15/68 . . Automatic cassette-changing arrangements **[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]**
17/028 . . . 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]**
17/04 . . Feeding or guiding single record carrier to or from transducing unit
17/22 . from random-access magazine of disc records

Note

Group G11B 17/30 takes precedence over groups G11B 17/24 to 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]**

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
19/20 . 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
19/26 . . Speed-changing arrangements; Reversing arrangements; Drive-transfer means therefor **[4]**
19/28 . . Speed controlling, regulating or indicating (G11B 19/24takes 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
21/08 . . 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
21/16 . Supporting the heads; Supporting the sockets for plug-in heads
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

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

In group G11B 23/00, recording or reproducing apparatus does not include the record carriers. **[5]**

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]**
23/03 . . Containers for flat record carriers **[4]**
23/033 . . . for flexible discs **[4]**
23/04 . . Magazines; Cassettes (G11B 23/12 takes precedence)
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]**
23/113 . . 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
23/28 . indicating prior or unauthorised use
23/30 . with provision for auxiliary signals
23/38 . Visual features other than those contained in record tracks or represented by sprocket holes
23/50 . Reconditioning of record carriers; Cleaning of record carriers (G11B 3/00 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]

25/04 . using flat record carriers, e.g. disc, card

27/00 Editing; **Indexing**; **Addressing**; **Timing or synchronising**; **Monitoring**; **Measuring tape travel [2,4]**

27/02 . Editing, e.g. varying the order of information signals recorded on, or reproduced from, record carriers **[5]**
27/022 . . Electronic editing of analogue information signals, e.g. audio or video signals **[5]**
27/031 . . Electronic editing of digitised analogue information signals, e.g. audio or video signals **[5]**
27/10 . Indexing; Addressing; Timing or synchronising; Measuring tape travel **[2]**
27/11 . . by using information not detectable on the record carrier **[4]**
27/19 . . by using information detectable on the record carrier **[4]**
27/28 . . . by using information signals recorded by the same method as the main recording
27/30 . . . . on the same track as the main recording
27/32 . . . . on separate auxiliary tracks of the same or an auxiliary record carrier
27/34 . . Indicating arrangements
27/36 . Monitoring, i.e. supervising the progress of recording or reproducing

31/00 Arrangements for the associated working of recording or reproducing apparatus with related apparatus (with cameras or projectors G03B 31/00) **[1,7]**

31/02 . with automatic musical instruments

33/00 Constructional parts, details or accessories not provided for in the other groups of this subclass [4]

33/02 . Cabinets; Cases; Stands; Disposition of apparatus therein or thereon **[4]**
33/04 . . modified to store record carriers **[4]**
33/06 . . combined with other apparatus having a different main function **[4]**
33/08 . . Insulation or absorption of undesired vibrations or sounds **[4]**
33/12 . Disposition of constructional parts in the apparatus, e.g. of power supply, of modules **[4]**
33/14 . Reducing influence of physical parameters, e.g. temperature change, moisture, dust **[4]**

G11C STATIC STORES (information storage based on relative movement between record carrier and transducer G11B; semiconductor devices for storage H01L, e.g. H01L 27/108 to H01L 27/115; pulse technique in general H03K, e.g. electronic switches H03K 17/00)

(1) This subclass covers devices or arrangements for storage of digital or analogue information:
(i) in which no relative movement takes place between an information storage element and a transducer;
(ii) which incorporate a selecting-device for writing-in or reading-out the information into or from the store.
(2) 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.
(3) In this subclass, the following terms are used with the meaning indicated: **[8]**
– "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; **[8]**
– "memory" is a device, including storage elements, which can hold information to be extracted when desired. **[8]**

Subclass index

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

5/06 . Arrangements for interconnecting storage elements electrically, e.g. by wiring

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 11/34; 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 11/34) **[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]**

7/10 . 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]**

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 11/34) **[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]**

11/00 Digital stores characterised by the use of particular electric or magnetic storage elements; **Storage elements therefor** (G11C 14/00 to G11C 21/00 take precedence) **[5]**

Note

Group G11C 11/56 takes precedence over groups G11C 11/02 to G11C 11/54. **[2]**

11/02 . using magnetic elements

11/18 . using Hall-effect devices

11/19 . using non-linear reactive devices in resonant circuits **[2]**

11/21 . using electric elements **[2]**

11/22 . . using ferroelectric elements **[2]**

11/34 . . using semiconductor devices **[2]**

11/36 . . . using diodes, e.g. as threshold elements **[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]**

11/406 . . . . . 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]**

11/407 . . . . . for memory cells of the field-effect type **[5]**

11/408 . . . . . Address circuits **[5]**

11/409 . . . . . Read-write (R-W) circuits **[5]**

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]**

11/417 . . . . . for memory cells of the field-effect type **[5]**

11/418 . . . . . Address circuits **[5]**

11/419 . . . . . Read-write (R-W) circuits **[5]**

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)

11/54 . 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

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]**

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]**

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]**

17/04 . 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]**

17/14 . 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]**

19/00 **Digital stores in which the information is moved stepwise, e.g. shift registers** (counting chains H03K 23/00)

21/00 **Digital stores in which the information circulates** (stepwise G11C 19/00)

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**

27/00 **Electric analogue stores, e.g. for storing instantaneous values**

29/00 **Checking stores for correct operation**; **Testing stores during standby or offline operation [1,8]**

29/02 . Detection or location of defective auxiliary circuits, e.g. defective refresh counters **[8]**

29/04 . Detection or location of defective memory elements **[8]**

29/52 . Protection of memory contents; Detection of errors in memory contents **[8]**

29/54 . Arrangements for designing test circuits, e.g. design for test (DFT) tools **[8]**

29/56 . External testing equipment for static stores, e.g. automatic test equipment (ATE); Interfaces therefor **[8]**

99/00 **Subject matter not provided for in other groups of this subclass [8]**

G12 INSTRUMENT DETAILS

G12B DETAILS OF INSTRUMENTS, OR COMPARABLE DETAILS OF OTHER APPARATUS, NOT OTHERWISE PROVIDED FOR

(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

1/00 **Sensitive elements capable of producing movement or displacement for purposes not limited to measurement**; **Associated transmission mechanisms therefor**

3/00 **Details of movements not otherwise provided for** (damping of shock or vibrations in general F16F; avoiding out-of-balance forces F16F 15/00; testing balance G01M) **[1,7]**

5/00 **Adjusting position or attitude, e.g. level, of instruments or other apparatus, or of parts thereof** (levels per se G01C 9/00); **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**

11/00 **Indicating elements**; **Illumination thereof**

13/00 **Calibrating of instruments or apparatus** (calibrating of measuring instruments G01)

15/00 **Cooling** (by refrigeration, e.g. circulation of refrigerated fluid, F25D; heat-exchange or heat-transfer details of general application F28F)

17/00 **Screening** (insulation or other protection of buildings E04B; emergency protection of apparatus in general F16P 7/00; in connection with acoustic waves G10K 11/00; in connection with nuclear radiation G21F)

Note

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.

NUCLEONICS

G21 NUCLEAR PHYSICS; NUCLEAR ENGINEERING

G21B FUSION REACTORS (uncontrolled reactors G21J)

Subclass index

1/00 Thermonuclear fusion reactors [1,8]
1/01 . Hybrid fission-fusion nuclear reactors **[8]**
1/03 . with inertial plasma confinement **[8]**
1/05 . with magnetic or electric plasma confinement **[8]**
1/11 . Details **[8]**
1/25 . Maintenance, e.g. repair or remote inspection **[8]**

3/00 Low-temperature nuclear fusion reactors, e.g. alleged cold fusion reactors [8]

G21C NUCLEAR REACTORS (analogue computers therefor G06G 7/00; fusion reactors, hybrid fission-fusion reactors G21B; nuclear explosives G21J)

Subclass index

1/00 Reactors

3/00 Reactor fuel elements or their assemblies; Selection of substances for use as reactor fuel elements
3/02 . Fuel elements
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
3/326 . . . 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]**
3/33 . . . 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]**
3/34 . . . Spacer grids
3/42 . Selection of substances for use as reactor fuel

5/00 Moderator or core structure; Selection of materials for use as moderator

7/00 Control of nuclear reaction
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

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]**

11/00 Shielding structurally associated with the reactor

13/00 Pressure vessels; Containment vessels; Containment in general (for chemical or physical processes B01J 3/00; pressure vessels in general F16J 12/00)
13/08 . Vessels characterised by the material; Selection of materials for pressure vessels

15/00 Cooling arrangements within the pressure vessel containing the core; Selection of specific coolants
15/18 . Emergency cooling arrangements; Removing shut-down heat

17/00 Monitoring; Testing (measuring in general G01)
17/003 . Remote inspection of vessels, e.g. pressure vessels **[5]**
17/007 . . Inspection of the outer surfaces of vessels **[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

17/06 . 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 17/02)

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

17/14 . 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

19/20 . Arrangements for introducing objects into the pressure vessel; Arrangements for handling objects within the pressure vessel; Arrangements for removing objects from the pressure vessel

19/28 . Arrangements for introducing fluent material into the reactor core; Arrangements for removing fluent material from the reactor core (pumping coolant G21D)

19/34 . Apparatus or processes for dismantling nuclear fuel, e.g. before reprocessing (shielded cells G21F 7/00) **[5]**

19/42 . Reprocessing of irradiated fuel

21/00 Apparatus or processes specially adapted to the manufacture of reactors or parts thereof (in general, section B, e.g. B23)

23/00 Adaptations of reactors to facilitate experimentation or irradiation [3]

G21D NUCLEAR POWER PLANT (electric or magnetic analogue computers, e.g. simulators, for nuclear physics G06G 7/00)

1/00 Details of nuclear power plant (control G21D 3/00)

1/02 . Arrangements of auxiliary equipment

3/00 Control of nuclear power plant (control of nuclear reaction in general G21C 7/00)

3/08 . Regulation of any parameters in the plant

5/00 Arrangements of reactor and engine in which reactor-produced heat is converted into mechanical energy

7/00 Arrangements for direct production of electric energy from fusion or fission reactions (structural combination of fuel element with thermoelectric element G21C 3/00; obtaining electric energy from radioactive sources G21H 1/00)

9/00 Arrangements to provide heat for purposes other than conversion into power, e.g. for heating buildings

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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 17/00; in cosmonautic vehicles B64G; combined with a reactor G21C 11/00; combined with X-ray tubes H01J 35/00; combined with X-ray apparatus H05G 1/00)

1/00 Shielding characterised by the composition of the material

3/00 Shielding characterised by its physical form, e.g. granules, or shape of the material

5/00 Transportable or portable shielded containers

5/002 . Containers for fluid radioactive wastes **[5]**

5/005 . Containers for solid radioactive wastes, e.g. for ultimate disposal **[5]**

5/008 . . Containers for fuel elements **[5]**

7/00 Shielded cells or rooms (chambers provided with manipulating devices in general B25J)

7/005 . Shielded passages through walls; Locks; Transferring devices between rooms (between glove-boxes G21F 7/00) **[5]**

9/00 Treating radioactively contaminated material; **Decontamination arrangements therefor [2,5]**

9/04 . Treating liquids **[2]**

9/06 . . Processing (separating different isotopes of the same chemical element B01D 59/00)

9/12 . . . by absorption; by adsorption; by ion-exchange

9/16 . . . by fixation in stable solid media

9/28 . Treating solids **[2]**

9/30 . . Processing (separating different isotopes of the same chemical element B01D 59/00)

9/34 . . Disposal of solid waste

G21G **CONVERSION OF CHEMICAL ELEMENTS**; **RADIOACTIVE SOURCES** (applications of radiation in general G21H 5/00; handling particles, e.g. neutrons, or electromagnetic radiation not otherwise provided for G21K) **[2]**

1/00 **Arrangements for converting chemical elements by electromagnetic radiation, corpuscular radiation, or particle bombardment, e.g. producing radioactive isotopes** (separation of different isotopes of the same element B01D 59/00; by thermonuclear reactions in nuclear reactors G21B; conversion of nuclear fuel in nuclear reactors G21C) **[2]**

4/00 **Radioactive sources** (producing neutrons or other subatomic particles, X- or gamma rays, in fusion reactors G21B, in nuclear reactors G21C, by cosmic radiation G21H 7/00, in accelerators H05H; X-ray tubes H01J 35/00; gamma masers H01S 4/00) **[2]**

5/00 **Alleged conversion of chemical elements by chemical reaction**

7/00 **Conversion of chemical elements not provided for in other groups of this subclass [2009.01]**

G21H **OBTAINING ENERGY FROM RADIOACTIVE SOURCES**; **APPLICATIONS OF RADIATION FROM RADIOACTIVE SOURCES**; **UTILISING COSMIC RADIATION** (measurement of nuclear or X-radiation G01T; fusion reactors G21B; nuclear reactors G21C; semiconductor devices sensitive to electromagnetic or corpuscular radiation H01L 31/00)

1/00 **Arrangements for obtaining electrical energy from radioactive sources, e.g. from radioactive isotopes**

3/00 **Arrangements for direct conversion of radiation energy from radioactive sources into forms of energy other than electric energy, e.g. light** (lasers H01S 3/00)

5/00 **Applications of radiation from radioactive sources or arrangements therefor** (producing mutation in plants A01H 1/06; preservation of dairy products A23C; 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 3/34; for after-treatment of coatings applied as liquids or other fluent materials B05D 3/06; for action between electric vehicles and tracked apparatus B61L 1/00, B61L 3/00; introducing isotopes into organic compounds C07B 59/00; for preparation of organic chemical compounds C07, C08, e.g. C08F 2/46; for treating macromolecular substances or articles made therefrom B29C 71/00, C08J 3/28, C08J 7/00; for cracking of hydrocarbon oils C10G 15/00, C10G 32/00; for reforming naphtha C10G 35/00; preservation or ageing of products obtained from fermentation processes C12H 1/00; for bleaching fibres D06L 3/00; measuring G01; 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 3/00)

7/00 **Use of effects of cosmic radiation**

G21J **NUCLEAR EXPLOSIVES**; **APPLICATIONS THEREOF**

Note

This subclass covers uncontrollable fission or fusion reactions.

1/00 **Nuclear explosive devices**

3/00 **Peaceful applications of nuclear explosive devices**

5/00 **Detection arrangements for nuclear explosions**

G21K TECHNIQUES FOR HANDLING PARTICLES OR ELECTROMAGNETIC RADIATION NOT OTHERWISE PROVIDED FOR; IRRADIATION DEVICES; GAMMA- OR X-RAY MICROSCOPES (X-ray technique H05G; plasma technique H05H) [2]

1/00 Arrangements for handling radiation or particles, e.g. focusing, moderating (radiation filters G21K 3/00) **[2]**

1/02 . using diaphragms, collimators **[2]**

3/00 Radiation filters, e.g. X-ray filters [2]

4/00 Conversion screens for the conversion of the spatial distribution of X-rays or particle radiation into visible images, e.g. fluoroscopic screens (photographic processes using X-ray intensifiers G03C 5/16; discharge tubes comprising luminescent screens H01J 1/00; cathode ray tubes for X-ray conversion with optical output H01J 31/08) **[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]**

5/10 . with provision for relative movement of beam source and object to be irradiated **[3]**

7/00 Gamma- or X-ray microscopes [2]

G99 SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION [8]

G99Z SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION [8]

Note

This subclass covers subject matter that: **[8]**
(a) is not provided for, but is most closely related to, the subject matter covered by the subclasses of this section, and **[8]**
(b) is not explicitly covered by any subclass of another section. **[8]**

99/00 Subject matter not otherwise provided for in this section [8]