

CPC COOPERATIVE PATENT CLASSIFICATION

G PHYSICS

NOTES

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 or in different conditions or 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 used appearing in the notes of several of the classes in this Section, particularly of "measuring" in class [G01](#) and "control" and "regulation" in class [G05](#).
3. The classification of inventions in this Section may present more difficulty than in others 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 of inventions, and also 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 which may be irrelevant to the form of the apparatus concerned - 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 connected with the pressure (another subclass of [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 some other apparatus ([G05](#)). The classification scheme is intended to enable things of a similar nature (as indicated above) to be classified together, and it is therefore particularly necessary for the real nature of any invention to be decided before it can be properly classified.

INSTRUMENTS

G01 MEASURING (counting [G06M](#)); TESTING

NOTES

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 title of Section [G](#), especially as regards the definition of the term "variable".

G01

(continued)

4. In many measuring arrangements, a first variable to be measured is transformed into a second, or further, variables. The second, or further, variables may be (a) a condition related to the first variable and produced in a member, or (b) a displacement of a member. Further transformation may be needed.
When classifying such an arrangement, (i) the transformation step, or each transformation step, that is of interest is classified, or (ii) if interest lies only in the system as a whole, the first variable is classified in the appropriate place.
This is particularly important where two or more conversions take place, for instance where a first variable, for example pressure, is transformed into a second variable, for example an optical property of a sensing body, and that second variable is expressed by means of a third variable, for example an electric effect. In such a case, the following classification places should be considered: the place for the transformation of the first variable, that for sensing the condition caused by that variable, subclass [G01D](#) for expression of the measurement, and finally the place for the overall system, if any
5. The measurement of change in the value of a physical property is classified in the same subclass as measurement of that physical property, e.g. measurement of expansion of length is classified in [G01B](#).

G01B

MEASURING LENGTH, THICKNESS OR SIMILAR LINEAR DIMENSIONS; MEASURING ANGLES; MEASURING AREAS; MEASURING IRREGULARITIES OF SURFACES OR CONTOURS {(measuring human body, [see the relevant places](#), where such exist, e.g. [A41H 1/00](#), [A43D 1/02](#), [A61B 5/103](#); measuring appliances combined with walking-sticks [A45B 3/08](#); sorting according to dimensions [B07](#); tool-setting or drawing instruments not specially modified for measuring [B23B 49/00](#), [B23Q 15/00](#) - [B23Q 17/00](#), [B43L](#); combinations of measuring devices with writing-appliances [B43K 29/08](#); geodetical, nautical or aeronautical measuring, surveying, rangefinding [G01C](#); photogrammetry [G01C 11/00](#); measuring force or stress, in general [G01L 1/00](#); investigating or analysing particle size, investigating or analysing surface area of porous material [G01N](#); measuring position, distance or direction, in general, by reception or emission of radiowaves or other waves and based on propagation effects, e.g. Doppler effect, propagation time, direction of propagation [G01S](#); geophysical measuring [G01V](#); measuring length or roll diameter of film in cameras or projectors [G03B 1/60](#); combinations of measuring devices with means for controlling or regulating [G05](#); methods or arrangements for converting the position of a manually-operated writing or tracing member into an electrical signal [G06K 11/00](#); measuring elapsed travel of recording medium in recording and playback equipment, sensing diameter of record in autochange gramophones [G11B](#); means structurally associated with electric rotary current collectors for indicating brush wear [H01R 39/58](#); indicating consumption of electrodes in arc lamps [H05B 31/34](#))}

NOTES

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

G01C

MEASURING DISTANCES, LEVELS OR BEARINGS; SURVEYING; NAVIGATION; GYROSCOPIC INSTRUMENTS; PHOTOGRAMMETRY OR VIDEOGRAMMETRY (measuring dimensions or angles of objects [G01B](#); measuring liquid level [G01F](#); measuring intensity or direction of magnetic fields, other than the earth's field, in general [G01R](#); radio navigation, determining distance or velocity by use of propagation effects, e.g. Doppler effects, propagation time, of radio waves, analogous arrangements using other waves [G01S](#); optical systems therefor [G02B](#); maps, globes [G09B](#))

NOTES

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.

G01C

(continued) 2. Attention is drawn to the Notes following the title of class [G01](#).

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

NOTES

1. This subclass covers :
 - devices for indicating or recording the results of measurements, not peculiar to variables covered by a single other subclass;
 - analogous apparatus 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](#).

G01F MEASURING VOLUME, VOLUME FLOW, MASS FLOW OR LIQUID LEVEL; METERING BY VOLUME (milk flow sensing devices in milking machines or devices [A01J 5/01](#); 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 7/16](#); pumps, fluid motors, details common to measuring or metering devices and pumps or fluid motors [F01 - F04](#); {sampling [G01N 1/00](#)}; 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](#); {coin-freed apparatus for metering flow of liquid or gas [G07F 15/00](#)})

NOTE

Attention is drawn to the Notes following the title of class [G01](#).

G01G WEIGHING (sorting by weighing [B07C 5/16](#))

NOTE

Attention is drawn to the Notes following the title of class [G01](#).

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 1/14](#); 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 42/06](#); 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](#), {[H03H 3/007](#), [H03H 9/00](#)})

NOTES

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](#).

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](#))

NOTES

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](#).

G01K MEASURING TEMPERATURE; MEASURING QUANTITY OF HEAT; THERMALLY-SENSITIVE ELEMENTS NOT OTHERWISE PROVIDED FOR (sensing temperature changes for compensating measurements of other variables for compensating readings of instruments for variation in temperature, [see G01D](#) or relevant subclasses 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 1/02](#))

NOTES

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](#).
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".

G01L MEASURING FORCE, STRESS, TORQUE, WORK, MECHANICAL POWER, MECHANICAL EFFICIENCY, OR FLUID PRESSURE (sensing pressure changes for compensating measurements of other variables or compensating readings of instruments for variations in pressure [G01D](#) or other relevant subclasses for the variable measured; weighing [G01G](#); converting a pattern of forces into electrical signals [G06K 11/00](#))

NOTE

Attention is drawn to the Notes following the title of class [G01](#).

G01M TESTING STATIC OR DYNAMIC BALANCE OF MACHINES OR STRUCTURES; TESTING STRUCTURES OR APPARATUS NOT OTHERWISE PROVIDED FOR {(devices for testing the performance of portable percussive tools with fluid-pressure drive [B25D 9/005](#))}

NOTE

Attention is drawn to the Note following the title of Class [G01](#).

WARNING

Subject matter covered by these groups is classified in the following CPC groups: - **G01M/38** covered by [G01M 1/14](#) and [G01M 1/30](#) and subgroups

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](#); 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 or methods in general, using reception or emission of radiowaves or other waves and based on propagation effects, e.g. Doppler effect, propagation time, direction of propagation, [G01S](#); determining sensitivity, graininess, or density of photographic materials [G03C 5/02](#); testing component parts of nuclear reactors [G21C 17/00](#); {controlling or regulating non-electric variables [G05D](#); measuring degree of ionisation of ionised gases, i.e. plasma [H05H 1/0006](#); testing electrographic developer properties [G03G 15/0848](#)})

NOTES

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. Inventions relating to investigating the properties of materials, specially adapted for use in processes covered by subclass [B23K](#), are classified in group [B23K 31/12](#).

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 1/54](#); 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](#); measuring direction or velocity of solid objects by reception or emission of radiowaves 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](#); {measuring or recording the speed of trains [B61L 23/00](#); speed indicators incorporated in motor vehicles [B60K 35/00](#); measuring frequency or phase [G01R](#); traffic control [G08G](#)})

NOTES

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".

G01P

(continued) 2. Attention is drawn to the Notes following the title of class [G01](#).**G01Q SCANNING-PROBE TECHNIQUES OR APPARATUS; APPLICATIONS OF SCANNING-PROBE TECHNIQUES, e.g. SCANNING PROBE MICROSCOPY [SPM]****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.

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 3/12](#); monitoring electronic pulse counters [H03K 21/40](#); monitoring operation of communication systems [H04](#))**NOTES**

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;
 - 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, group [G01R 17/00](#) takes precedence over groups [G01R 19/00](#) - [G01R 31/00](#).

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 ({for special applications, see the relevant subclasses, e.g. [A61B](#), [G01F](#), [G01N](#), [G02B](#); measuring dimensions or angles of objects [G01B](#); navigation in general [G01C](#); measuring infrasonic, sonic or ultrasonic vibrations in general [G01H](#); measuring infra-red, visible, or ultra-violet radiation in general [G01J](#); transducers per se, see the relevant subclasses, e.g. [G01L](#), [H01L](#), [H04R](#); measuring direction or velocity of flowing fluids by reception or emission of radiowaves or other waves and based on propagation effects caused in the fluid itself [G01P](#); measuring electric or magnetic variables in general [G01R](#); detecting masses or objects by methods not involving reflection or radiation of radio, acoustic or other waves [G01V](#); {time-interval measuring [G04F](#)}; aerials [H01Q](#))**NOTES**

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

WARNING

G01S
(continued) The following IPC group is not used in the CPC scheme. Subject matter covered by this group is classified in the following CPC groups:
G01S 7/26 covered by [G01S 7/06](#)

G01T **MEASUREMENT OF NUCLEAR OR X-RADIATION** (radiation analysis of materials, mass spectrometry [G01N](#); counters per se [G06M](#), [H03K](#); electric discharge tubes for analysing radiation or particles [H01J 40/00](#), [H01J 47/00](#), [H01J 49/00](#))

NOTES

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](#).

G01V **GEOPHYSICS; GRAVITATIONAL MEASUREMENTS; DETECTING MASSES OR OBJECTS** (detecting or locating foreign bodies for diagnostic, surgical or person-identification purposes [A61B](#); means for indicating the location of accidentally buried, e.g. snow-buried persons [A63B 29/02](#); investigating or analysing earth materials by determining their chemical or physical properties [G01N](#); measuring electric or magnetic variables in general, other than direction or magnitude of the earth's field [G01R](#); electronic or nuclear magnetic resonance arrangements [G01R 33/20](#); radar, sonar or analogous methods in general, detecting masses or objects involving these methods [G01S](#))

NOTES

1. In this subclass, the geophysical methods apply both to the earth and to other celestial objects, e.g. planets.
2. Attention is drawn to the Notes following the title of class [G01](#).

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

G01V 3/11 covered by [G01V 3/101](#), [G01V 3/104](#)

G01W **METEOROLOGY** (influencing weather conditions [A01G 15/00](#); dispersing fog [E01H 13/00](#); instruments for measuring single variable in general, see the appropriate subclass of [G01](#), e.g. [G01K](#), [G01L](#); obtaining meteorological information by radar [G01S 13/95](#))

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.

G02B **OPTICAL ELEMENTS, SYSTEMS, OR APPARATUS** ([G02F](#) takes precedence; measuring-instruments, see the relevant subclass of [G01](#), e.g. optical rangefinders [G01C](#); testing of optical elements, systems, or apparatus [G01M 11/00](#); spectacles [G02C](#); sound lenses [G10K 11/30](#); electron and ion "optics" [H01J](#); X-ray "optics" [H01J](#), [H05G 1/00](#); optical elements structurally combined with electric discharge tubes [H01J 5/16](#), [H01J 29/89](#), [H01J 37/22](#); microwave "optics" [H01Q](#); combination of optical elements with television receivers [H04N 5/72](#); heating arrangements specially adapted for transparent or reflecting areas [H05B 3/84](#); {optical apparatus **42H**})

NOTE

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

- G02B
(continued)
- "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) 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.

WARNING

The following IPC groups are not used in the CPC classification system. Subject matter covered by these groups is classified in the CPC groups:

G02B 11/00 - G02B 11/34	covered by	G02B 9/00 and subgroups and G02B 13/00 and subgroups
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G02C **SPECTACLES; SUNGLASSES OR GOGGLES INsofar AS THEY HAVE THE SAME FEATURES AS SPECTACLES; CONTACT LENSES** (trial frames for testing the eyes [A61B 3/04](#); goggles or eyeshields not having the same features as spectacles [A61F 9/00](#))

NOTE

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

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](#), {[G06E 3/001](#)} ; 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](#))

WARNING

The following IPC group is not used in the CPC scheme.

Subject matter covered by these groups is classified in the following CPC groups:

G02F 1/13357	covered by	G02F 1/1336 and subgroups
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G03 **PHOTOGRAPHY; CINEMATOGRAPHY; ELECTROGRAPHY; HOLOGRAPHY** (reproduction of pictures or patterns by scanning and converting into electrical signals [H04N](#))

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](#); systems for automatic generation of focusing signals for optical elements *per se* [G02B 7/28](#); photosensitive materials or processes for photographic purposes [G03C](#); apparatus for processing exposed photographic materials [G03D](#))

NOTES

1. 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.
2. {This subclass covers:
 - apparatus or methods for taking photographs using light sensitive film for image capture, apparatus, or methods for printing, for projecting or viewing images using film stock, photographic film or slides by optical means, e.g. mounting of optical elements, flashes, or their related controls, e.g. exposure, focus, (opto-)mechanical motion blur (anti-shake), cooling, beam shaping;
 - aspects of apparatus or methods for taking photographs using an electronic image sensor [EIS] for image capture, insofar as they correspond to those of said apparatus or methods for taking photographs using light sensitive film, i.e. insofar not peculiar to the presence of the EIS, e.g. mounting of optical elements or flashes not peculiar to the presence of the EIS, or their related controls insofar they are not peculiar to the presence of the EIS, e.g. exposure, focus, (opto-) mechanical motion blur (anti-shake);
 - aspects of apparatus or methods for projecting or viewing images using an electronic spatial light modulator [ESLM], insofar as they correspond to those of said apparatus or methods for projecting or viewing images using film stock, photographic film or slides, i.e. insofar as not peculiar to the presence of the ESLM, e.g. mounting of optical elements not peculiar to the presence of the ESLM, or their related controls not peculiar to the presence of the ESLM, e.g. cooling, beam shaping, optical keystone correction;
 - (opto-)mechanical image enhancement in printers or projectors, e.g. keystone correction;
 - optical viewfinders;
 - remote control of cameras and projectors insofar not peculiar to the EIS or ESLM;
 - optical aspects of camera modules using electronic image sensors or related constructional details;
 - constructional aspects of projectors, e.g. cooling, beam shaping, light integrating means not peculiar to the ESLM.}
3. {This subclass does not cover:
 - concerning cameras or projectors:
 - arrangements or methods for image capture peculiar to the presence or use of an EIS or image projection peculiar to the presence or use of an ESLM, and their related controls insofar they are peculiar to the presence or use of the EIS or ESLM, which are covered by [H04N](#);
 - processing of electrical image signals from the EIS or provided to the ESLM, which is covered by [H04N](#);
 - electronic viewfinders, e.g. control of image pickup devices based on information indicated by the electronic viewfinder displaying an image signal generated by the EIS, which are covered by [H04N](#);
 - electrical or mechanical aspects of camera modules using electronic image sensors and related constructional details as in webcams or mobile phones, which are covered by [H04M](#), [H04N](#);
 - details of projectors peculiar to the use of an ESLM, e.g. dichroic or polarizing arrangements specially adapted for the ESLM, which are covered by [H04N](#);
 - remote control of cameras or projectors peculiar to the EIS or the ESLM, e.g. affecting their operation, or based on a generated electrical image signal, which is covered by [H04N](#);
 - adaptations peculiar to the use of an EIS or ESLM or the display, the transmission, recording or other use of electrical image data and related circuitry, e.g. mounting of EIS or ESLM, integrated cleaning system for the EIS, dust mapping, cooling of the EIS. which are covered by [H04N](#);
 - video cameras, TV cameras, e.g. in studios, CCTV cameras, surveillance cameras and camcorders; constructional and mechanical details related to such cameras, e.g. housings, even when not peculiar to the presence of an EIS, which are covered by [H04N 5/225](#);
 - systems or apparatus wherein the inventive contribution lies in features covered above, concerning cameras when interacting with those to be covered by [G03B](#), e.g. switch-over between electronic motion-blur correction of electronic viewfinder during focussing and optical motion-blur correction of the lens during exposure, electronic-motion blur correction of the electronic image signal based on output signals of additional sensor, or interaction between mechanical shutter and electronic control of the charge accumulation period of the EIS, which are covered by [H04N](#).
 - EIS-sensor read-out, which is covered by [H04N 5/335](#);
 - processing or use of electrical image signals from the EIS for the generation of camera control signals. e.g. focusing, exposure control, electronic blur correction, display in electronic viewfinder, which are covered by [H04N 5/232](#), [H04N 5/235](#).
 - optical parts for apparatus or arrangements for taking photographs or for projecting or viewing them, which are covered by [G02B](#);
 - photosensitive materials for photographic purposes, which are covered by [G03C](#);

G03B

(continued)

- apparatus for processing exposed photographic materials; accessories therefor, which are covered by [G03D](#).
 - optical elements or arrangements associated with solid state imager structures, which are covered by [H01L 27/146](#);
4. {In this subclass the following expression is used with the meaning indicated:
subject to the application of Notes 1 and 2 above, "photography" is the process of recording pictures by means of capturing light on a light-sensitive medium, e.g. silver halide based chemical or an electronic image sensor. Light patterns reflected or emitted from objects expose such a light sensitive medium during a timed exposure, usually through a photographic lens in a device known as a camera. }
5. {In this subclass, as in subclass [H04N](#), the following terms are used with the meaning indicated:
- "camera": a device capturing image information represented by light patterns reflected or emitted from objects, and exposing a light sensitive film or a main electronic image sensor during a timed exposure, usually through a photographic lens, and producing an image on a light sensitive film or an electrical image information signal respectively;
 - "projector": a device displaying image information by projection of light patterns, usually through an optical lens, wherein the light patterns are generated by illuminating an image, e.g. film or slide, or by converting an electric image signal into an optical signal using an electronic spatial light modulator;
 - "electronic image sensor [EIS]": optoelectronic transducer, converting optical image information into an electrical signal susceptible of being processed, stored, transmitted or displayed;
 - "additional sensor": a sensor, other than the main electronic image sensor, used for controlling a camera;
 - "electronic spatial light modulator [ESLM]": optoelectronic transducer converting electric signals representing image information into optical image information. }

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](#); electrophotography, magnetography [G03G](#))

NOTE

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

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

WARNING

The following IPC group is not used in the CPC scheme.

Subject matter covered by this group is classified in the following CPC group:

[G03C 9/08](#)

covered by

[G03F 7/0037](#)

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](#))

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](#); electrophotography, sensitive layers or processes therefor [G03G](#))

NOTE

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

- "photosensitive" means not only sensitive to electro- magnetic 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.

G03F

(continued)

WARNING

The following IPC groups are not used in the CPC system. Subject matter covered by these groups is classified in the following CPC groups :

G03F 3/08	covered by	H04N 1/46
G03F 7/207	covered by	G03F 7/20
G03F 7/23	covered by	G03F 7/22
G03F 9/02	covered by	G03F 9/00

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](#))

NOTES

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](#).

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 27/44](#); systems using moirè fringes [G02B 27/60](#); optical logic elements [G02F 3/00](#); stereo-photography [G03B 35/00](#); photosensitive materials or processes for photographic purposes [G03C](#); {stereo-photographic or similar processes [G03C 9/00](#)}; 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 19/16](#); holographic storage [G11B 7/0065](#), [G11C 13/04](#); {stereoscopic or other three dimensional effects in television systems [H04N 13/00](#)})

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.

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 pre-selected times or after predetermined time intervals [G04C 23/00](#); clocks or watches with stop devices [G04F 7/08](#))

NOTE

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

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.

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

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, analogue/digital conversion [H03K](#) {time fuzes [F42C 9/00](#)})

NOTE

This subclass covers:

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

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[G04F 10/08](#)

covered by

[G04F 5/16](#)

G04G ELECTRONIC TIME-PIECES

NOTES

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

G04R RADIO-CONTROLLED TIME-PIECES

G05 CONTROLLING; REGULATING (specially adapted to a particular field of use, see the relevant place for that field, e.g. [A62C 37/00](#), [B03B 13/00](#), [B23Q](#))

NOTES

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;

G05

(continued)

- "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 subclass*, e.g. [G12B](#), subclass of [G01](#), [H01](#); correcting units, *see the appropriate subclass*, e.g. [H02K](#))

NOTES

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 applications of such systems or elements, which are covered by subclass [G05D](#) or [G05F](#).
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 or specific control systems are classified in the group relevant to that system, if not otherwise provided for.

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](#))

NOTES

1. This subclass does not cover features of general applicability to regulating systems, e.g. anti-hunting arrangements, which are covered by subclass [G05B](#).
2. In this subclass, the following term is used with the meaning indicated:
 - "systems" includes self-contained devices such as speed governors, pressure regulators.
3. Control systems specially adapted for particular apparatus, machines or processes are classified in the subclasses for the apparatus, machines or processes, provided that there is specific provision for control or regulation relevant to the special adaptation, either at a detailed level, (e.g. [A21B 1/40](#) : "for regulating temperature in bakers' ovens") or at a general level, (e.g. [B23K 9/095](#) : "for automatic control of welding parameters in arc welding"). Otherwise, classification is made in the most appropriate place in this subclass.

The following are lists of places where there is specific provision of the kind referred to above. Where such provision is at a detailed level, the places have been grouped according to the main groups of this subclass. Where the provision is at a general level (e.g. of a kind appropriate to more than one of the main groups specified in the lists, or to main groups [G05D 27/00](#) or [G05D 29/00](#)), the places are listed under the title "General References".

Places related to [G05D 1/00](#)

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

Places related to [G05D 3/00](#)

A43D 119/00	Footwear manufacture
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G05D

(continued)

B21K 31/00	Tool carriers in forging or pressing
B23B 39/26	Pattern-controlled boring or drilling tools
B23D 1/30 , B23D 3/06 , B23D 5/04	Planing or slotting machines controlled by copying device
B23H 7/18	Electrode to workpiece spacing in electricdischargte and electrochemical machining
B23K 26/02	Workpiece in laser welding or cutting
B23K 37/04	Workpiece in welding
B23K 37/06	Molten metal in welding
B23Q 5/20	Spindles in machine tools
B23Q 15/00 , B23Q 16/00	Tool or work position in machine tools
B23Q 35/00	Tools controlled by pattern or master model
B24B 17/00	Grinding controlled by patterns, drawings,magnetic tape or the like
B24B 47/22	Starting position in grinding
B30B 15/24	Actuating members in presses
B62D 55/116	Chassis of tracked vehicles
B65H 23/18	Web-advancing mechanisms
E02F 3/43	Dippers or buckets in dredgers
F15B 9/00	Fluid-pressure servomotors with follow-upaction
F24J 2/38	Tracking of solar haet collectors
G03F 9/00	Photomechanical production of patterned or textured surfaces
G11B 5/588	Rotating heads in information storage systems
G21C 7/12	Movement of control elements in nuclearreactors
Places related to G05D 5/00	
A24B 7/14	Tobacco cutting
B05C 11/02	Thickness of coating of fluent material onsurface
B21B 37/16	Thickness, width, diameter or othertransverse dimensions of the products ofmetal-rolling mills
C03B 18/04	Dimension of glass ribbon
D21F 7/06	Thickness of layer in paper making
Places related to G05D 7/00	
A45D 20/26	Air in hair drying helmets
A61M 5/168	Flow of media to the human body
B03C 3/36	Gases or vapour in electrostatic separators
B05C 11/10	Fluent material in coating devices
B67D 1/12	Dispensing beverages on draught
B67D 7/28	Transferring liquids
C10K 1/28	Gas purifiers
E21B 21/08	Flushing boreholes
E21B 43/12	Obtaining liquids from wells
F01D 17/00	Flow in non-positive-displacement machinesor systems
F01M 1/16	Lubrication arrangements
F01P 7/00	Coolant flow in cooling devices
F02C 9/16 , F02C 9/50	Gas-turbine working fluid
F16L 55/027	Throttle passages in pipes
F24F 11/00	Air-flow or supply of heating or cooling fluids in air treatment arrangements
F26B 21/12	Air or gas flow in dryers
G01G 11/08	Continuous flow weighing apparatus
G21D 3/14	Coolant in nuclear power plant
Places related to G05D 9/00	
B01D 21/34	Liquid level in sedimentation arrangements
B41L 27/04	Ink level in printing, manifolding orduplicating arrangements
F22D 5/00	Feed water for boilers
H01J 1/10 , H01J 13/14	Liquid pool electrodes in electric dischargetubes or lamps
Places related to G05D 11/00	
B01D 21/32	Density in sedimentation arrangements
B01F 15/04	Mixers
B24C 7/00	Abrasive blasts
B28C 7/00	Mixtures of clays or cements
B65G 53/66	Bulk material conveyors
F02K 3/075	Flow ratio in jet-propulsion plants
Places related to G05D 13/00	
B21C 1/12	Drum speed in metal drawing
B23Q 15/00	Cutting velocity of tool or work
B30B 15/20	Ram speed in presses
B60K 31/00	Setting or limiting speed of vehicles
B60L 15/00	Electrically-propelled vehicles

G05D (continued)	B64D 31/08 D01D 1/09 D01G 15/36 D02H 13/14 D03D 51/16 G01N 30/32 G11B 15/46 G11B 19/28 Places related to G05D 15/00 B25D 9/26 B30B 15/22 B65H 59/00 {B65H 23/00, B65H 59/00} B66D 1/50 D03D 49/04 D05B 47/04 D21F 3/06 F26B 13/12 F26B 21/10 G11B 15/43 Places related to G05D 16/00 B60C 23/00 B63C 11/08 B64D 13/00 B65G 53/66 D01D 1/09 E21B 21/08 F01M 1/16 G01N 30/32 H01J 7/14 H01K 1/52 Places related to G05D 19/00 B25D 9/26 B65G 27/32 Places related to G05D 21/00 B01D 21/32 B01D 53/30 G01N 30/34 Places related to G05D 22/00 A01G 25/16 A01K 41/04 A24B 9/00 F24F 11/00 F26B 21/08 Places related to G05D 23/00 A21B 1/40 A45D 6/20 B21C 31/00 B60C 23/00 B64G 1/50 C03B 18/18, C03B 18/22 D01D 1/09 D04B 35/30 D06F 75/26 D21F 5/06 F01M 5/00 F16N 7/08 F22G 5/00 F26B 21/10 G01N 30/30 H01M 10/60 H05B 6/06, H05B 6/50, H05B 6/68 H05G 1/36	Cruising speed of aircraft Feed rate in manufacture of artificial filaments, threads, fibres, bristles or ribbons Carding machines Warping, beaming or leasing machines Cyclically varying speed of looms Speed of fluid carrier in chemical analysis Filamentary or web record carriers or heads for such carriers in information storage systems Non-filamentary, non-web record carriers, or heads for such carriers in information storage systems Portable percussive tools Ram pressure in presses Tension in filamentary material Tension in webs, tapes, filamentary material Rope, cable or chain tension Tension in looms Tension in sewing machines Pressure in paper-making machines Drying fabrics Pressure in dryers Record carrier tension in information storage arrangements Tyre pressure Air within diving suit Aircraft air-pressure Bulk material conveyors Manufacture of artificial filaments, threads, fibres, bristles or ribbons Flushing boreholes Lubrication arrangements Pressure of fluid carrier in chemical analysis Pressure in electric discharge tubes or lamps Pressure in electric incandescent lamps Portable percussion tools Jigging conveyors Density in sedimentation arrangements Treating gases or vapours Composition of fluid carrier in chemical analysis Watering gardens, fields, sports grounds or the like Poultry incubators Tobacco products Air conditioning Dryers Bakers' ovens Hair curlers Metal extruding Tyre temperature Cosmonautic vehicles Float baths in glass making Manufacture of artificial filaments, threads, fibres, bristles or ribbons Knitting machines Hand irons Paper-making machines Lubricant in lubrication arrangements Arrangements for supplying oil or unspecified lubricant from a reservoir Steam superheat Dryers Temperature of fluid carrier in chemical analysis Electric storage cells Dielectric, induction or microwave heating Anode of X-ray tube
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G05D
(continued)

Places related to G05D 25/00

[B41B 21/08](#) Photographic composing machines
[H01S 3/10](#), [H05B 33/08](#), Lasers and other light sources
[H05B 35/00](#) to [H05B 43/00](#)

General references

[A01J 5/007](#) Milking machines
[B23K 9/095](#) Welding parameters
[B23Q 35/00](#) Copying
[B24B 17/00](#), [B24B 49/00](#) Grinding or polishing
[B24C 7/00](#) Abrasive blasts
[B67D 1/12](#) Dispensing beverages on draught
[G03G 21/20](#) Electrographic, electrophotographic or magnetographic processes
[H02P 5/00](#) - [H02P 9/00](#) Dynamo-electric motors or generators

G05F SYSTEMS FOR REGULATING ELECTRIC OR MAGNETIC VARIABLES (regulating the timing or recurrence frequency of pulses in radar or radio navigation systems [G01S](#); closed-loop systems for regulating non-electric variables by electric means [G05D](#); regulating power supply of digital computers [G06F 1/26](#); regulating electric power distribution networks [H02J](#); regulating the charging of batteries [H02J 7/00](#); regulation of the output of static converters, e.g. switching regulators [H02M](#); regulation of the output of electric generators [H02N](#), [H02P 9/00](#), [H03L](#); 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](#); regulating characteristics of transmission lines [H04B](#); electric control of X-ray apparatus [H05G 1/30](#))

NOTES

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 invention resides in the combination.
2. This subclass does not cover elements per se, which are covered by the relevant subclasses.

WARNING

The following IPC groups are not used in the internal CPC classification scheme.

Subject matter covered by these groups is classified in the following CPC groups:

G05F 3/28	covered by	G05F 3/26
G05F 5/02	covered by	G05F 5/00
G05F 5/04	covered by	G05F 5/00
G05F 5/06	covered by	G05F 5/00
G05F 5/08	covered by	G05F 5/00

G05G CONTROL DEVICES OR SYSTEMS INsofar AS CHARACTERISED BY MECHANICAL FEATURES ONLY ("Bowden" or like mechanisms [F16C 1/10](#); gearings or mechanisms not peculiar to this purpose [F16H](#); speed changing or reversing mechanisms for gearings conveying rotary motion [F16H 59/00](#) - [F16H 63/00](#))

NOTES

1. This subclass covers:
 - members of general applicability for mechanical control;
 - mechanical systems for moving members to one or more definite settings.
2. Systems peculiar to the control of particular machines or apparatus provided for in a single other class are classified in the relevant class for such machines or apparatus, for example:

A61G 13/02	Controls for adjusting operating tables
A61G 15/02	Controls for adjusting operating chairs
A63F 13/20 , A63F 13/98	Accessories for games using an electronically generated display
B25J	Manipulators, e.g. controls therefor
B60K 26/00	Arrangement or mounting of propulsion-unit control devices in vehicles
B60T 7/00	Vehicle brake-action initiating means

G05G

(continued)

B62D 33/073	Adaptations of control devices for movable vehicle cabs
B62K 21/00	Cycle-steering devices
B62K 23/00	Rider-operated controls specially adapted for cycles
B62L 3/00	Brake-actuating mechanisms specially adapted for cycles
B63H 25/02	Marine steering initiating means
B66B 1/00	Controls for elevators
B66C 13/18	Control systems or devices for cranes
B66C 13/56	Arrangements of handles or pedals for crane operation
E02F 9/20	Control devices for dredging or soil shifting machines
F16C 3/28	Adjustable cranks or eccentrics
F16D 43/00	Automatic clutches
F16K 31/00 , F16K 33/00	Controls for valves
F16P 3/00	Safety devices acting in conjunction with the control or operation of a machine
F16P 7/02	Stopping machines on occurrence of dangerous conditions therein
G02B 21/32	Micromanipulators structurally combined with microscopes
G04B 1/00 - G04B 18/00	Driving mechanisms in clocks or watches
G06C	Digital computers in which all the computation is effected mechanically
G06F 3/02	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.

G06

COMPUTING; CALCULATING; COUNTING (score computers for games [A63B 71/06](#), [A63D 15/20](#), [A63F 1/18](#); combinations of writing implements with computing devices [B43K 29/08](#))

NOTE

Attention is drawn to the notes (particularly the definition of the term "variable") on page [G3] of the Int.Cl. In this class:

- The term "data" is understood to be synonymous with "information", and the term "information" is therefore not used in [G06C](#);
- The terms "calculating" and "computing" are both understood to include, inter alia, operations on numerical values and on data expressed in numerical form; of these words "computing" is used throughout the class. "Computation" is derived from this interpretation of "computing". In the French language the word "calcul" will serve for either word;
- In those subclasses which include simulators:
 - a simulator in [G06](#) is concerned with the mathematics of computing the existing or anticipated conditions within the real device or system;
 - Control functions derived from simulators are not in [G06](#) but are generally in [G05](#), although they may be in the subclass for the device controlled;
 - measurement of an individual variable to serve as an input to a simulator is in [G01](#) { 21E; 42; 119 }
 - a simulator is regarded as a teaching or training device proper to [G09](#) if the simulator gives perceptible sensations having a likeness to the sensations the student would experience in reality in response to actions taken by him. Simulators which demonstrate, by means involving computing, the functioning of apparatus or of a system are in [G06](#), if no provision exists elsewhere. Components of simulators, if identical with real devices or machines, are classified in the relevant subclass for these devices or machines and not in [G06](#) or [G09](#);
 - a simulator may use the same time scale as the real device or operate on an expanded or compressed time scale;
 - models of real devices to reduced or expanded scales are not regarded as simulators
- The term "record carrier" is understood to mean 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.

G06C

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

NOTE

Details of mechanisms covered in main groups [G06C 9/00](#), [G06C 11/00](#) or [G06C 15/00](#), which are applicable to mechanical counters driven only through the lowest denomination, are classified in [G06M](#)

G06D DIGITAL FLUID-PRESSURE COMPUTING DEVICES**NOTE**

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

G06E OPTICAL COMPUTING DEVICES; {COMPUTING DEVICES USING OTHER RADIATIONS WITH SIMILAR PROPERTIES} (optical logic elements [per se G02F 3/00](#); digital storage using optical elements [G11C 13/04](#))**NOTES**

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

G06F ELECTRICAL DIGITAL DATA PROCESSING (computers in which a part of the computation is effected hydraulically or pneumatically [G06D](#); optically [G06E](#); self-contained input or output peripheral equipment [G06K](#); 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](#) - [G06F 5/00](#) and [G06F 9/00](#) - [G06F 13/00](#).

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

G06F 3/18	covered by	G06F 3/00 , G06K 11/00
G06F 7/04	covered by	G06F 7/02
G06F 9/302 - G06F 9/318	covered by	G06F 9/30
G06F 9/40	covered by	G06F 9/4425 and subgroups
G06F 9/42	covered by	G06F 9/4426 and subgroups
G06F 9/45	covered by	G06F 8/41 and subgroups

G06G ANALOGUE COMPUTERS (analogue optical computing devices [G06E 3/00](#))**G06J HYBRID COMPUTING ARRANGEMENTS** (optical hybrid computing devices [G06E 3/00](#); {fuzzy computing [G06N 7/02](#)}; neural networks for image data processing [G06T](#); analog/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.

G06K RECOGNITION OF DATA; PRESENTATION OF DATA; RECORD CARRIERS; HANDLING RECORD CARRIERS**NOTES**

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.

G06M **COUNTING MECHANISMS; COUNTING OF OBJECTS NOT OTHERWISE PROVIDED FOR** (counting by measuring volume or weight of articles to be counted [G01F](#), [G01G](#); computers [G06C](#) - [G06J](#); counting electric pulses [H03K](#); counting characters, words or messages in switching networks for transmission of digital information [H04L 12/08](#))

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.

G06N **COMPUTER SYSTEMS BASED ON SPECIFIC COMPUTATIONAL MODELS**

G06Q **DATA PROCESSING SYSTEMS OR METHODS, SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING PURPOSES; SYSTEMS OR METHODS SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING PURPOSES, NOT OTHERWISE PROVIDED FOR**

NOTES

1. Groups [G06Q 10/00](#) - [G06Q 50/00](#) and [G06Q 99/00](#) only cover systems or methods that involve significant data processing operations, i.e. data processing operations that need to be carried out by a technological, e.g. computing, system or device. Group [G06Q 90/00](#) covers systems or methods that do not involve significant data processing, when both of the following conditions are fulfilled:
 - the systems or methods are specially adapted for the purposes mentioned in the subclass title or the titles of groups [G06Q 10/00](#) - [G06Q 50/00](#); and
 - the systems or methods cannot be classified elsewhere in the IPC, for example by applying the principles described in paragraph 96 of the Guide.
 When classifying such systems or methods in group [G06Q 90/00](#), additional classification may be made in the most closely related group of this or any other subclass, if this classification gives information about the application of the systems or methods that could be of interest for searching. Such non-obligatory classification must be given as "additional information".
2. When classifying in groups [G06Q 10/00](#) - [G06Q 40/00](#), systems or methods that are specially adapted for a specific business sector must also be classified in group [G06Q 50/00](#), when the special adaptation is determined to be novel and non-obvious.
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.

WARNING

[G06Q](#) has been largely refined to bring most of the former USPC 705 groups into ECLA, prior to CPC launch. Therefore, most of the new [G06Q](#) subdivisions are not complete pending reclassification. Users are invited to systematically consult also the hierarchically higher groups, up to the first valid IPC group. For example, while searching in [G06Q 50/2053](#), it is appropriate to consult also [G06Q 50/205](#) and [G06Q 50/20](#)

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

NOTES

1. This subclass covers:
 - arrangements for geometrically modelling objects, whether the final model is used for display of an image of the object or for some other purpose, such as manufacture of a corresponding object;
 - arrangements for analysing the geometric attributes of an image of an object.
2. This subclass does not cover:
 - reading or recognising printed or written characters or recognising patterns, e.g. fingerprints, which is covered by subclass [G06K](#);
 - modification of image data to allow display using multiple viewports, which is covered by subclass [G09G](#);
 - circuits for generating functions for visual indicators, which are covered by subclass [G09G](#);
 - scanning of documents or the like in pictorial communication, which is covered by subclass [H04N](#).

WARNING

G06T
(continued)

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[G06T 1/40](#)

covered by

[G06T 1/20](#)

G07 CHECKING-DEVICES

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

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 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](#))

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

NOTES

1. In this subclass, the following terms or expressions are used with the meaning indicated:
 - "coins" also covers tokens of similar nature;
 - "paper currency or similar valuable papers" covers banknotes, bills, cheques, vouchers, securities, bonds or the like.
2. This subclass covers handling of "coins" or "paper currency" insofar as they carry distinctive value features representative of money or the like.

Informative references:

- sorting in general [B07C](#)
- handling paper sheets in general [B65H](#)
- counting by weighing [G01G](#)
- counting of objects in general, i.e. without discriminating of denominations, [G06M](#)

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[G07D 13/00](#)

covered by

[G07D 11/00](#) and subgroup.

G07F COIN-FREED OR LIKE APPARATUS ([coin sorting G07D 3/00](#); [coin testing G07D 5/00](#); [{handling coins or paper currencies apart from payment activated apparatus G07D; payment architectures, schemes or protocols G06Q 20/00}](#))

NOTES

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 are used with the meaning indicated:
 - {"coin-freed" means "payment activated"}
 - "coins" covers also tokens or the like.

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

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](#); signalling or alarm devices in mines [E21F 17/18](#); lamps or shutters therefor [F21](#); 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](#); selecting arrangements [H04Q 5/00](#), [H04Q 9/00](#); loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers [H04R](#))}

NOTES

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.

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](#) or [H01](#); indicators or recorders, see the relevant subclasses, e.g. [G01D](#), [G09F](#); mechanical means for transferring the output of a sensing member [G01D 5/00](#); means for converting the output of the 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 [H03M](#); transmission of digital information [H04L](#); selective calling from one station to another [H04Q 9/00](#))

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 or analogous systems, sonar systems, lidar systems specially adapted for traffic control [G01S 13/91](#), [G01S 15/88](#), [G01S 17/88](#); {radar or analogous systems, sonar systems, lidar systems specially adapted for anti-collision purposes [G01S 13/93](#), [G01S 15/93](#), [G01S 17/93](#)})

NOTES

1. This subclass covers:
 - identification of traffic offenders;
 - indicating the position of vehicles for traffic control purposes;
 - navigation systems for traffic control purposes, i.e. systems in which the navigation is not performed autonomously by or in the vehicles, but where the vehicles are guided by instructions transmitted to them;
 - indication of free spaces in parking areas.
2. This subclass does not cover:
 - arrangements for measuring levels and bearings for surveillance and navigation, which are covered by [G01C](#);
 - radio navigation systems, e.g. for locating, measuring distances or velocity, which are covered by [G01S](#);
 - details of display instrumentation, which are covered by [G09F](#), [G09G](#)

G09 **EDUCATION; 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](#))

NOTES

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 demonstrate, by means involving computing, the function of apparatus or of a system, which 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](#)).

G09C CODING OR CIPHERING APPARATUS FOR CRYPTOGRAPHIC OR OTHER PURPOSES INVOLVING THE NEED FOR SECRECY (secret transmission [H04K](#); arrangements for secret telegraphic communication [H04L 9/00](#))

G09D RAILWAY OR LIKE TIME OR FARE TABLES; PERPETUAL CALENDARS (calendar blocks [B42D 5/04](#); clockwork driven [G04B](#); comprising computing means [G06C](#))

G09F DISPLAYING; ADVERTISING; SIGNS; LABELS OR NAME-PLATES; SEALS (display cases [A47F](#); designs or pictures characterised by special or unusual 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](#), {[G06F 3/14](#)} ; static indicating arrangements comprising integral associations of a plurality of light sources [H01J](#), [H01K](#), [H01L](#), [H05B 33/12](#))

NOTES

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.
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".

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 3/00](#); 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 21/18](#); 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](#))

NOTES

1. This subclass covers indicator consoles, i.e. arrangements or circuits for processing control signals to achieve the display, e.g. for the calling up, reception, storage, regeneration, coding, decoding, addressing of control signals.
2. This subclass does not cover the structural details of the indicating devices, such as panels or tubes per se, or assemblies of individual light sources, which are covered by the relevant subclasses, e.g. [H01J](#), [H01K](#), [H01L](#), [G02F](#), [G09F](#), [H05B](#).
3. Contrary to subclass [H04N](#), in which are classified display devices capable of representing continuous brightness value scales, this subclass is limited to devices using only a discrete number of brightness values, e.g. visible/non-visible.
4. The visual effect may be produced by a luminescent screen scanned by an electron beam, directly by controlled light sources, by projection of light, from controlled light sources onto characters, symbols, or elements thereof drawn on a support, or by electric, magnetic, or acoustic control of the parameters of light rays from an independent source.

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

G09G 5/32	covered by	G09G 5/42
G09G 5/37	covered by	G09G 5/39
G09G 5/373	covered by	G09G 5/39
G09G 5/377	covered by	G09G 5/39
G09G 5/38	covered by	G09G 5/42
G09G 5/397	covered by	G09G 5/395 , G09G 5/399

G10 MUSICAL INSTRUMENTS; ACOUSTICS

NOTES

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.

G10B ORGANS; HARMONIUMS OR LIKE WIND-ACTUATED MUSICAL INSTRUMENTS (mouth organs [G10D 7/12](#); accordions [G10D 11/00](#); aspects of automatic actuation [G10F 1/12](#); combinations of microphones, pick-ups or amplifiers with musical instruments [G10H](#); electronic organs [G10H 7/00](#))

G10C **PIANOS, HARPSICHORDS, SPINETTS OR SIMILAR STRINGED MUSICAL INSTRUMENTS WITH ONE OR MORE KEYBOARD** (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](#))

G10D **STRINGED MUSICAL INSTRUMENTS; WIND MUSICAL INSTRUMENTS; ACCORDIONS OR CONCERTINAS; PERCUSSION MUSICAL INSTRUMENTS; MUSICAL INSTRUMENTS NOT OTHERWISE PROVIDED FOR** (non-musical aspects of musical toy instruments [A63H 5/00](#); organs, harmoniums or like musical instruments with associated blowing apparatus [G10B](#); pianos, harpsichords, spinets or similar stringed musical instruments with one or more keyboards [G10C](#); automatic musical instruments [G10F](#); electrophonic musical instruments [G10H](#); instruments in which the tones are generated by electromechanical means or electronic generators, or in which the tones are synthesised from a data store [G10H](#))

NOTES

1. This subclass covers certain stringed musical instruments that can optionally include a keyboard, e.g. zithers.
2. This subclass does not cover pianos, harpsichords, spinets or similar stringed instruments provided by design with one or more keyboards, which are covered by subclass [G10C](#).

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](#).

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 5/02](#))

G10H **ELECTROPHONIC MUSICAL INSTRUMENTS** (electronic circuits in general [H03](#))

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 loud-speaker or equivalent instrument.

G10K **SOUND-PRODUCING DEVICES** (sound-producing toys [A63H 5/00](#); musical instruments or parts thereof, see the relevant subclass, e.g. [G10D](#)); **ACOUSTICS NOT OTHERWISE PROVIDED FOR** (systems using the reflection or reradiation of acoustic waves [G01S 15/00](#); generating seismic energy [G01V 1/02](#); signalling or calling arrangements, alarm arrangements [G08B](#); piezo-electric electrostrictive or magnetostrictive elements in general [H01L 41/00](#); transmission systems using infrasonic, sonic, or ultrasonic waves [H04B 11/00](#); loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers [H04R](#))

NOTES

1. This subclass covers arrangements for generating mechanical vibrations in fluids.
2. This subclass covers also the production of sounds which may not be audible to human beings but which are audible to animals.
3. In this subclass, the following terms are used with the meanings indicated:

G10K
(continued)

- "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.

G10L SPEECH ANALYSIS OR SYNTHESIS; SPEECH RECOGNITION; SPEECH OR VOICE PROCESSING; SPEECH OR AUDIO CODING OR DECODING

NOTE

This subclass does not cover:

- devices for the storage of speech signals, which are covered by subclasses [G11B](#) and [G11C](#);
- encoding of compressed speech signals for transmission or storage, which is covered by group [H03M 7/30](#).

G11 INFORMATION STORAGE

G11B INFORMATION STORAGE BASED ON RELATIVE MOVEMENT BETWEEN RECORD CARRIER AND TRANSDUCER ([{producing carriers of sound records for needle playback B29C 39/00}](#) ; recording measured values in a way that does not require playback through a transducer [G01D](#); photosensitive materials or processes for photographic purposes [G03C](#); electrography, electrophotography, magnetography [G03G](#); recording or playback apparatus using mechanically marked tape, e.g. punched paper tape, or using unit records, e.g. punched or magnetically marked cards, [G06K](#); transferring data from one type of record carrier to another [G06K 1/18](#); printing of data from record carriers [G06K 3/00](#); arrangements for producing a permanent visual presentation of the output data [G06K 15/00](#); arrangements or circuits for control of indicating devices using static means to present variable information [G09G](#); coding, decoding or code conversion, in general [H03M](#); circuits for coupling output of reproducer to radio receiver [H04B 1/20](#); circuits {or arrangements} specially adapted for {pictorial or} television signal recording {[H04N 1/21](#) } , [H04N 5/76](#), [H04N 9/79](#); loudspeakers, microphones, gramophone pick-ups or like acoustic electromechanical transducers or circuits therefor [H04R](#))

NOTES

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;
 - {relative positioning or movement of transducers and record carriers before, during or after transducing operation, e.g. for accessing record carriers or parts thereof, or for track change, selection or acquisition or for track following or for accessing parts of tracks;}
 - {driving or moving of heads or record carriers or both heads and record carriers for increasing, maintaining or decreasing the relative speed before, during or after transducing operation}
2. In this subclass, the following terms or expressions are used with the meanings indicated :
 - "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;
 - "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.
3. Documents concerning relative positioning or movement of transducers and record carriers are classified in groups [G11B 3/00](#) - [G11B 7/00](#) and [G11B 21/00](#) when only the transducer is controlled and in groups [G11B 15/00](#), [G11B 17/00](#) and [G11B 19/00](#) when only the record carrier is controlled. When both record carrier and head are controlled, the documents are classified in [G11B 15/1808](#), [G11B 15/1816](#), [G11B 19/00](#) and [G11B 27/002](#).
When a plurality of record carriers are controlled, the documents are classified in [G11B 15/68](#), [G11B 17/08](#), [G11B 17/22](#) and [G11B 27/002](#).
4. By "access" is meant an operation including a relative movement for positioning between record carrier and head before, during or after transducing; this operation including "seek", "select", "change", "acquire" and "follow" functions for at least a part of a track on at least one record carrier. By "programmed access" is meant a sequence of access operations the result of the sequence being to acquire a wanted sequence of parts of tracks or a wanted sequence of tracks. Relative movement

G11B

(continued)

between head and record carrier also covers the movement of a coupling beam such as a light beam between the head and a stationary record carrier.

5. "Movement of the head" also covers any virtual movement or any physical movement such as obtained by switching between successive transducing parts of the head or by moving the transducing zone of the head, i.e. by "scanning". If different transducing parts of the head are switchable, the number of transducing parts should be much smaller than the number of individual storage areas of the record carrier.
6. Attention is drawn to the notes of subclass [G11C](#).

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

G11B 5/65	covered by	G11B 5/64 - G11B 5/656
G11B 5/667	covered by	G11B 5/66
G11B 5/673	covered by	G11B 5/66
G11B 7/16	covered by	G11B 7/135
G11B 7/18	covered by	G11B 7/135
G11B 7/30	covered by	G11B 7/00
G11B 9/12 - G11B 9/14	covered by	G11B 9/00
G11B 11/24 - G11B 11/26	covered by	G11B 11/00
G11B 13/08	covered by	G11B

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](#) - [H01L 27/115](#); pulse technique in general [H03K](#), e.g. electronic switches [H03K 17/00](#); {using a static store as a picture recording medium [H04N 5/907](#)})

NOTES

1. This subclass covers devices or arrangements for storage of digital or analogue information in which no relative movement takes place between an information storage element and a transducer; which incorporate a selecting-device for writing-in or reading-out the information into or from the store
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:
 - "storage element" is an element which can hold at least one item of information and is provided with means for writing-in or reading-out this information;
 - "memory" is a device, including storage elements, which can hold information to be extracted when desired.

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

G11C 8/02	covered by	G11C 8/00 , H03K 17/00
G11C 11/4193	covered by	G11C 11/00
G11C 11/4195	covered by	G11C 11/00
G11C 11/4197	covered by	G11C 11/00

G12**INSTRUMENT DETAILS****G12B****CONSTRUCTIONAL DETAILS OF INSTRUMENTS, OR COMPARABLE DETAILS OF OTHER APPARATUS, NOT OTHERWISE PROVIDED FOR****NOTES**

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](#), [E](#), [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](#).

- G12B
(continued) 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](#).

NUCLEONICS

G21 NUCLEAR PHYSICS; NUCLEAR ENGINEERING

G21B FUSION REACTORS ([uncontrolled reactors G21J](#))

G21C NUCLEAR REACTORS ([analogue computers therefor G06G 7/54](#); [fusion reactors, hybrid fission-fusion reactors G21B](#); [nuclear explosives G21J](#))

WARNING

The following IPC groups are not used in the CPC scheme:

[G21C 1/01](#)

covered by

all other groups of [G21C](#)

[G21C 19/33](#)

covered by

all other subgroups of [G21C 19/34](#)

G21D NUCLEAR POWER PLANT ([electric or magnetic analogue computers, e.g. simulators, for nuclear physics G06G 7/54](#))

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](#); [in cosmonautic vehicles B64G](#); [combined with a reactor G21C 11/00](#); [combined with X-ray tubes H01J 35/16](#); [combined with X-ray apparatus H05G 1/02](#))

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](#))

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 electro-magnetic or corpuscular radiation H01L 31/00](#))

G21J NUCLEAR EXPLOSIVES; APPLICATIONS THEREOF ([electric or magnetic analogue computers, e.g. simulators, for nuclear physics G06G 7/54](#))

NOTE

This subclass [covers](#) uncontrollable fission or fusion reactions.

G21K TECHNIQUES FOR HANDLING PARTICLES OR IONISING RADIATION NOT OTHERWISE PROVIDED FOR; IRRADIATION DEVICES; GAMMA RAY OR X-RAY MICROSCOPES

NOTE

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

"particle" means a molecular, atomic or subatomic particle

WARNING

The following IPC group is not used in the CPC scheme. Subject matter covered this group is classified in the following CPC group:

[G21K 3/00](#)

covered by

[G21K 1/10](#)

G21Y INDEXING SCHEME RELATING TO NUCLEAR REACTORS, POWER PLANTS AND EXPLOSIVES, TO PROTECTION AGAINST RADIATION, TO THE TREATMENT OF RADIOACTIVELY CONTAMINATED MATERIAL, TO APPLICATIONS OF RADIOACTIVE SOURCES AND TO THE UTILISATION OF COSMIC RADIATION

NOTE

This subclass constitutes an internal scheme for indexing only, relating to problems ([G21Y 2002/00](#)) or solutions ([G21Y 2004/00](#)).