SECTION G — PHYSICS

G06 COMPUTING; CALCULATING OR COUNTING

Note(s) [2011.01]

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

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

Note(s)

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

Subclass index

1/00 **Computing aids in which the computing members form at least part of the displayed result and are manipulated directly by hand, e.g. abacus, pocket adding device [1, 2006.01]**

3/00 **Arrangements for table look-up, e.g. menstruation table [1, 2006.01]**

5/00 **Non-functional elements [1, 2006.01]**

5/02 • Housings; Frameworks **[1, 2006.01]**

7/00 **Input mechanisms** (pin carriage G06C 13/02) **[1, 2006.01]**

7/02 • Keyboards **[1, 2006.01]**

7/04 • • Interlocking devices, e.g. between keys (interlocking devices covered by this subclass, in general G06C 25/00) **[1, 2006.01]**

7/06 • • with one set of keys for each denomination **[1, 2006.01]**

7/08 • • with one set of keys for all denominations, e.g. ten-key board **[1, 2006.01]**

7/09 • Transfer of data from record carrier to computing mechanisms (sensing record carriers G06K 7/00) **[1, 2006.01]**

7/10 • Transfer mechanisms, e.g. transfer of a figure from a ten-key keyboard into the pin carriage **[1, 2006.01]**

7/12 • Resetting devices, e.g. for the keyboard **[1, 2006.01]**

9/00 **Transfer mechanisms, e.g. for transmitting figures from the input mechanism into the computing mechanism** (G06C 7/10, G06C 11/00, G06C 15/00 take precedence) **[1, 2006.01]**

9/02 • Back-transfer arrangements, e.g. to transfer a value accumulated in a register back into the selection mechanism **[1, 2006.01]**

11/00 **Output mechanisms** (marking record carriers in general, visual presentation in general of results of the mathematical operations G06K) **[1, 2006.01]**

11/02 • with visual indication, e.g. counter drum **[1, 2006.01]**

11/04 • with printing mechanisms, e.g. for character-at-a-time or line-at-a-time printing **[1, 2006.01]**

11/06 • • having type hammers **[1, 2006.01]**

11/08 • with punching mechanism **[1, 2006.01]**

11/10 • Arrangements for feeding single sheets or continuous web or tape, e.g. ejection device (conveying record carriers G06K 13/00); Line-spacing devices **[1, 2006.01]**

11/12 • • for feeding tape **[1, 2006.01]**

13/00 **Storage mechanisms** (mechanical counters with input only to the lowest order G06M; information storage in general G11) **[1, 2006.01]**

13/02 • Operand stores, e.g. pin carriage (input mechanisms G06C 7/00) **[1, 2006.01]**

13/04 • Print buffer stores **[1, 2006.01]**

15/00 **Computing mechanisms; Actuating devices therefor** (mechanisms for operating automatically upon more than two numbers otherwise than by repeated addition or subtraction G06C 21/00) **[1, 2006.01]**

15/02 • operating on the binary scale **[1, 2006.01]**

Note(s)

Group G06C 15/02 takes precedence over groups G06C 15/04-G06C 15/42.

15/04 • Adding or subtracting devices (G06C 15/08 takes precedence) **[1, 2006.01]**

15/06 • • having balance totalising; Obtaining sub-total **[1, 2006.01]**

15/08 • Multiplying or dividing devices; Devices for computing the exponent or root **[1, 2006.01]**

15/10 • • having more than one denominational set of keys operating directly on computing mechanism **[1, 2006.01]**

15/12 • • having pin carriage **[1, 2006.01]**

15/14 • • having pin wheel, e.g. Odhner type **[1, 2006.01]**

15/16 • • having stepped-toothed actuating drums, e.g. Thomas type **[1, 2006.01]**

15/18 • • having multiplication table for forming partial products **[1, 2006.01]**

15/20 • • adapted for short-cut multiplication or division **[1, 2, 2006.01]**

15/22 • Arrangements for two or more computing devices; Arrangements for subdivision into two or more computing mechanisms, e.g. splitting **[1, 2006.01]**

15/24 • Devices for counting the cycles of operation in division or multiplication (item-counting devices G06C 25/02) **[1, 2006.01]**

15/26 • Devices for transfer between orders, e.g. tens-transfer device **[1, 2006.01]**

15/28 • • where transfer is effected in one step **[1, 2006.01]**

15/30 • • where transfer is effected in two steps **[1, 2006.01]**

15/32 • • • with provision for simultaneous transfer between all orders **[1, 2006.01]**

15/34 • • where transfer is effected by planet gear, i.e. crawl type **[1, 2006.01]**

15/36 • • • with aligning means **[1, 2006.01]**

15/38 • • for pin-wheel computing mechanisms **[1, 2006.01]**

15/40 • • for stepped-toothed-drum computing mechanism **[1, 2006.01]**

15/42 • Devices for resetting to zero or other datum **[1, 2006.01]**

15/44 • Devices for comparing numerical values, e.g. zero check **[1, 2006.01]**

15/46 • Arrangements for rounding-off **[1, 2006.01]**

15/48 • Arrangements for selection of one out of several counting registers (arrangements for controlling subsequent operating functions G06C 21/04; item counters G06C 25/02) **[1, 2006.01]**

17/00 **Mechanisms for converting from one notational system to another, i.e. radix conversion [1, 2006.01]**

19/00 **Decimal-point mechanisms; Analogous mechanisms for non-decimal notations [1, 2006.01]**

19/02 • Devices for indicating the point **[1, 2006.01]**

19/04 • Devices for printing the point **[1, 2006.01]**

21/00 **Programming-mechanisms for determining the steps to be performed by the computing machine, e.g. when a key or certain keys are depressed** (mechanisms merely for producing multiplication by repeated addition G06C 15/08) **[1, 2006.01]**

21/02 • in which the operation of the mechanism is determined by the position of the carriage **[1, 2006.01]**

21/04 • Conditional arrangements for controlling subsequent operating functions, e.g. control arrangement triggered by a function key and depending on the condition of the register (arrangements for selection of one out of several counting registers G06C 15/48) **[1, 2006.01]**

23/00 **Driving mechanisms for functional elements [1, 2006.01]**

Note(s)

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

23/02 • of main shaft **[1, 2006.01]**

23/04 • of pin carriage, e.g. for step-by-step movement **[1, 2006.01]**

23/06 • of tabulation devices, e.g. of carriage skip **[1, 2006.01]**

23/08 • Hydraulic or pneumatic actuation **[1, 2006.01]**

25/00 **Auxiliary functional arrangements, e.g. interlocks** (interlocks in keyboards G06C 7/04) **[1, 2, 2006.01]**

25/02 • Item-counting devices (devices for counting the cycles of operation in division or multiplication G06C 15/24) **[1, 2006.01]**

27/00 Computing machines characterised by the structural interrelation of their functional units, e.g. invoicing machines [1, 2006.01]

29/00 Combinations of computing machines with other machines, e.g. with typewriter, with money-changing apparatus [1, 2006.01]

G06D DIGITAL FLUID-PRESSURE COMPUTING DEVICES

Note(s)

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

1/00 Details, e.g. functional units (individual logic elements F15C; valves F16K) **[1, 2006.01]**

1/02 • having at least one moving part, e.g. spool valve **[1, 2006.01]**

1/04 • • Adding; Subtracting **[1, 2006.01]**

1/06 • • Multiplying; Dividing **[1, 2006.01]**

1/08 • having no moving parts **[1, 2006.01]**

1/10 • • Adding; Subtracting **[1, 2006.01]**

1/12 • • Multiplying; Dividing **[1, 2006.01]**

3/00 Computing devices characterised by the interrelationship of the functional units and having at least one moving part [1, 2006.01]

5/00 Computing devices characterised by the interrelationship of the functional units and having no moving parts [1, 2006.01]

7/00 Computing devices characterised by the combination of hydraulic or pneumatic functional elements with at least one other type of functional element [1, 2006.01]

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

Note(s) [5]

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

1/00 Devices for processing exclusively digital data [5, 2006.01]

1/02 • operating upon the order or content of the data handled **[5, 2006.01]**

1/04 • • for performing computations using exclusively denominational number representation, e.g. using binary, ternary, decimal representation **[5, 2006.01]**

1/06 • • for performing computations using a digital non-denominational number representation, i.e. number representation without radix; using combinations of denominational and non-denominational number representations **[5, 2006.01]**

3/00 Devices not provided for in group G06E 1/00, e.g. for processing analogue or hybrid data [5, 2006.01]

G06F ELECTRIC DIGITAL DATA PROCESSING (computer systems based on specific computational models G06N)

Note(s)

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

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

Subclass index

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

1/02 • Digital function generators **[1, 2006.01]**

1/025 • • for functions having two-valued amplitude, e.g. Walsh functions **[5, 2006.01]**

1/03 • • working, at least partly, by table look-up (G06F 1/025 takes precedence) **[5, 2006.01]**

Note(s) [5]

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

1/035 • • • Reduction of table size **[5, 2006.01]**

1/04 • Generating or distributing clock signals or signals derived directly therefrom **[1, 2006.01]**

1/06 • • Clock generators producing several clock signals **[5, 2006.01]**

1/08 • • Clock generators with changeable or programmable clock frequency **[5, 2006.01]**

1/10 • • Distribution of clock signals **[5, 2006.01]**

1/12 • • Synchronisation of different clock signals **[5, 2006.01]**

1/14 • • Time supervision arrangements, e.g. real time clock **[5, 2006.01]**

1/16 • Constructional details or arrangements **[5, 2006.01]**

1/18 • • Packaging or power distribution **[5, 2006.01]**

1/20 • • Cooling means **[5, 2006.01]**

1/22 • Means for limiting or controlling the pin/gate ratio **[5, 2006.01]**

1/24 • Resetting means **[5, 2006.01]**

1/26 • Power supply means, e.g. regulation thereof (for memories G11C) **[5, 2006.01]**

1/28 • • Supervision thereof, e.g. detecting power-supply failure by out of limits supervision **[5, 2006.01]**

1/30 • • Means for acting in the event of power-supply failure or interruption, e.g. power-supply fluctuations (for resetting only G06F 1/24) **[5, 2006.01]**

1/32 • • Means for saving power **[5, 2006.01, 2019.01]**

1/3203 • • • Power management, i.e. event-based initiation of a power-saving mode **[2019.01]**

1/3206 • • • • Monitoring of events, devices or parameters that trigger a change in power modality **[2019.01]**

1/3209 • • • • • Monitoring remote activity, e.g. over telephone lines or network connections **[2019.01]**

1/3212 • • • • • Monitoring battery levels, e.g. power saving mode being initiated when battery voltage goes below a certain level **[2019.01]**

1/3215 • • • • • Monitoring of peripheral devices **[2019.01]**

1/3218 • • • • • • of display devices **[2019.01]**

1/3221 • • • • • • of disk drive devices **[2019.01]**

1/3225 • • • • • • of memory devices **[2019.01]**

1/3228 • • • • • Monitoring task completion, e.g. by use of idle timers, stop commands or wait commands **[2019.01]**

1/3231 • • • • • Monitoring the presence, absence or movement of users **[2019.01]**

1/3234 • • • • Power saving characterised by the action undertaken **[2019.01]**

1/3237 • • • • • by disabling clock generation or distribution **[2019.01]**

1/324 • • • • • by lowering clock frequency **[2019.01]**

1/3246 • • • • • by software initiated power-off **[2019.01]**

1/3287 • • • • • by switching off individual functional units in the computer system **[2019.01]**

1/329 • • • • • by task scheduling **[2019.01]**

1/3293 • • • • • by switching to a less power-consuming processor, e.g. sub-CPU **[2019.01]**

1/3296 • • • • • by lowering the supply or operating voltage **[2019.01]**

3/00 Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit, e.g. interface arrangements [1, 4, 2006.01]

3/01 • Input arrangements or combined input and output arrangements for interaction between user and computer (G06F 3/16 takes precedence) **[2006.01]**

3/02 • • Input arrangements using manually operated switches, e.g. using keyboards or dials **[1, 3, 2006.01]**

3/023 • • • Arrangements for converting discrete items of information into a coded form, e.g. arrangements for interpreting keyboard generated codes as alphanumeric codes, operand codes or instruction codes **[3, 2006.01]**

3/027 • • • • for insertion of the decimal point **[3, 2006.01]**

3/03 • • Arrangements for converting the position or the displacement of a member into a coded form **[3, 2006.01]**

Note(s) [2006.01]

In this group, the first place priority rule is applied, i.e. at each hierarchical level, in the absence of an indication to the contrary, classification is made in the first appropriate place.

3/033 • • • Pointing devices displaced or positioned by the user; Accessories therefor (digitisers characterised by the transducing means G06F 3/041) **[3, 2006.01, 2013.01]**

3/0338 • • • • with detection of limited linear or angular displacement of an operating part of the device from a neutral position, e.g. isotonic or isometric joysticks **[2013.01]**

3/0346 • • • • with detection of the device orientation or free movement in a 3D space, e.g. 3D mice, 6-DOF [six degrees of freedom] pointers using gyroscopes, accelerometers or tilt-sensors **[2013.01]**

3/0354 • • • • with detection of 2D relative movements between the device, or an operating part thereof, and a plane or surface, e.g. 2D mice, trackballs, pens or pucks **[2013.01]**

3/0362 • • • • with detection of 1D translations or rotations of an operating part of the device, e.g. scroll wheels, sliders, knobs, rollers or belts **[2013.01]**

3/037 • • • • using the raster scan of a cathode-ray tube [CRT] for detecting the position of the member, e.g. light pens cooperating with CRT monitors **[3, 2006.01, 2013.01]**

3/038 • • • • Control and interface arrangements therefor, e.g. drivers or device-embedded control circuitry **[2006.01, 2013.01]**

3/039 • • • • Accessories therefor, e.g. mouse pads **[2006.01, 2013.01]**

3/041 • • • Digitisers, e.g. for touch screens or touch pads, characterised by the transducing means **[2006.01]**

3/042 • • • • by opto-electronic means **[2006.01]**

3/043 • • • • using propagating acoustic waves **[2006.01]**

3/044 • • • • by capacitive means **[2006.01]**

3/045 • • • • using resistive elements, e.g. a single continuous surface or two parallel surfaces put in contact **[2006.01]**

3/046 • • • • by electromagnetic means **[2006.01]**

3/047 • • • • using sets of wires, e.g. crossed wires **[2006.01]**

3/048 • • Interaction techniques based on graphical user interfaces [GUI] **[2006.01, 2013.01]**

Note(s) [2013.01]

This group covers subject matter where the focus is placed on the way the user can interact with the displayed data. The mere presence of a standard GUI in the context of the disclosure of a specific software application or a specific device capable of processing data related to its specific function, should in general be classified in the appropriate subclasses related to those software applications or specific devices.

3/0481 • • • based on specific properties of the displayed interaction object or a metaphor-based environment, e.g. interaction with desktop elements like windows or icons, or assisted by a cursor's changing behaviour or appearance **[2013.01]**

3/0482 • • • • interaction with lists of selectable items, e.g. menus **[2013.01]**

3/0483 • • • • interaction with page-structured environments, e.g. book metaphor **[2013.01]**

3/0484 • • • for the control of specific functions or operations, e.g. selecting or manipulating an object or an image, setting a parameter value or selecting a range **[2013.01]**

3/0485 • • • • Scrolling or panning **[2013.01]**

3/0486 • • • • Drag-and-drop **[2013.01]**

3/0487 • • • using specific features provided by the input device, e.g. functions controlled by the rotation of a mouse with dual sensing arrangements, or of the nature of the input device, e.g. tap gestures based on pressure sensed by a digitiser **[2013.01]**

3/0488 • • • • using a touch-screen or digitiser, e.g. input of commands through traced gestures **[2013.01]**

3/0489 • • • • using dedicated keyboard keys or combinations thereof **[2013.01]**

3/05 • Digital input using the sampling of an analogue quantity at regular intervals of time **[1, 2006.01]**

3/06 • Digital input from, or digital output to, record carriers **[1, 2006.01]**

3/08 • • from or to individual record carriers, e.g. punched card **[1, 2006.01]**

3/09 • Digital output to typewriters **[3, 2006.01]**

3/12 • Digital output to print unit **[1, 2006.01]**

3/13 • Digital output to plotter **[3, 2006.01]**

3/14 • Digital output to display device **[1, 2006.01]**

3/147 • • using display panels **[3, 2006.01]**

3/153 • • using cathode-ray tubes **[3, 2006.01]**

3/16 • Sound input; Sound output (speech processing G10L) **[1, 2006.01]**

3/18 • Digital input from automatic curve follower **[3, 2006.01]**

5/00 Methods or arrangements for data conversion without changing the order or content of the data handled [1, 4, 2006.01]

5/01 • for shifting, e.g. justifying, scaling, normalising **[5, 2006.01]**

5/06 • for changing the speed of data flow, i.e. speed regularising **[1, 2006.01]**

5/08 • • having a sequence of storage locations, the intermediate ones not being accessible for either enqueue or dequeue operations, e.g. using a shift register **[2006.01]**

5/10 • • having a sequence of storage locations each being individually accessible for both enqueue and dequeue operations, e.g. using random access memory **[2006.01]**

5/12 • • • Means for monitoring the fill level; Means for resolving contention, i.e. conflicts between simultaneous enqueue and dequeue operations **[2006.01]**

5/14 • • • • for overflow or underflow handling, e.g. full or empty flags **[2006.01]**

5/16 • • Multiplexed systems, i.e. using two or more similar devices which are alternately accessed for enqueue and dequeue operations, e.g. ping-pong buffers **[2006.01]**

7/00 Methods or arrangements for processing data by operating upon the order or content of the data handled (logic circuits H03K 19/00) **[1, 2006.01]**

7/02 • Comparing digital values (G06F 7/06, G06F 7/38 take precedence) **[1, 2006.01]**

7/04 • • Identity comparison, i.e. for like or unlike values **[1, 2006.01]**

7/06 • Arrangements for sorting, selecting, merging, or comparing data on individual record carriers **[1, 2006.01]**

7/08 • • Sorting, i.e. grouping record carriers in numerical or other ordered sequence according to the classification of at least some of the information they carry (by merging two or more sets of carriers in ordered sequence G06F 7/16) **[1, 2006.01]**

7/10 • • Selecting, i.e. obtaining data of one kind from those record carriers which are identifiable by data of a second kind from a mass of ordered or randomly-distributed record carriers **[1, 2006.01]**

7/12 • • • with provision for printing-out a list of selected items **[1, 2006.01]**

7/14 • • Merging, i.e. combining at least two sets of record carriers each arranged in the same ordered sequence to produce a single set having the same ordered sequence **[1, 2006.01]**

7/16 • • • Combined merging and sorting **[1, 2006.01]**

7/20 • • Comparing separate sets of record carriers arranged in the same sequence to determine whether at least some of the data in one set is identical with that in the other set or sets **[1, 2006.01]**

7/22 • Arrangements for sorting or merging computer data on continuous record carriers, e.g. tape, drum, disc **[1, 2006.01]**

7/24 • • Sorting, i.e. extracting data from one or more carriers, re-arranging the data in numerical or other ordered sequence, and re-recording the sorted data on the original carrier or on a different carrier or set of carriers (G06F 7/36 takes precedence) **[1, 2006.01]**

7/26 • • • the sorted data being recorded on the original record carrier within the same space in which the data had been recorded prior to their sorting, without using intermediate storage **[1, 2006.01]**

7/32 • • Merging, i.e. combining data contained in ordered sequence on at least two record carriers to produce a single carrier or set of carriers having all the original data in the ordered sequence (G06F 7/36 takes precedence) **[1, 2006.01]**

7/36 • • Combined merging and sorting **[1, 2006.01]**

7/38 • Methods or arrangements for performing computations using exclusively denominational number representation, e.g. using binary, ternary, decimal representation **[1, 3, 2006.01]**

7/40 • • using contact-making devices, e.g. electromagnetic relay (G06F 7/46 takes precedence) **[1, 2006.01]**

7/42 • • • Adding; Subtracting **[1, 2006.01]**

7/44 • • • Multiplying; Dividing **[1, 2006.01]**

7/46 • • using electromechanical counter-type accumulators **[1, 2006.01]**

7/48 • • using non-contact-making devices, e.g. tube, solid state device; using unspecified devices **[1, 3, 2006.01]**

7/483 • • • Computations with numbers represented by a non-linear combination of denominational numbers, e.g. rational numbers, logarithmic number system or floating-point numbers **[2006.01]**

7/485 • • • • Adding; Subtracting **[2006.01]**

7/487 • • • • Multiplying; Dividing **[2006.01]**

7/49 • • • Computations with a radix, other than binary, 8, 16 or decimal, e.g. ternary, negative or imaginary radices, mixed radix **[3, 2006.01]**

7/491 • • • Computations with decimal numbers **[2006.01]**

7/492 • • • • using a binary weighted representation within each denomination **[2006.01]**

7/493 • • • • • the representation being the natural binary coded representation, i.e. 8421-code **[2006.01]**

7/494 • • • • • • Adding; Subtracting **[2006.01]**

7/495 • • • • • • • in digit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other **[2006.01]**

7/496 • • • • • • Multiplying; Dividing **[2006.01]**

7/498 • • • • using counter-type accumulators **[2006.01]**

7/499 • • • Denomination or exception handling, e.g. rounding, overflow **[2006.01]**

7/50 • • • Adding; Subtracting (G06F 7/483-G06F 7/491, G06F 7/544-G06F 7/556 take precedence) **[1, 3, 2006.01]**

7/501 • • • • Half or full adders, i.e. basic adder cells for one denomination **[2006.01]**

7/502 • • • • • Half adders; Full adders consisting of two cascaded half adders **[2006.01]**

7/503 • • • • • using carry switching, i.e. the incoming carry being connected directly, or only via an inverter, to the carry output under control of a carry propagate signal **[2006.01]**

7/504 • • • • in bit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other **[2006.01]**

7/505 • • • • in bit-parallel fashion, i.e. having a different digit-handling circuit for each denomination **[2006.01]**

7/506 • • • • • with simultaneous carry generation for, or propagation over, two or more stages **[2006.01]**

7/507 • • • • • • using selection between two conditionally calculated carry or sum values **[2006.01]**

7/508 • • • • • • using carry look-ahead circuits **[2006.01]**

7/509 • • • • • for multiple operands, e.g. digital integrators **[2006.01]**

7/52 • • • Multiplying; Dividing (G06F 7/483-G06F 7/491, G06F 7/544-G06F 7/556 take precedence) **[1, 3, 2006.01]**

7/523 • • • • Multiplying only **[2006.01]**

7/525 • • • • • in serial-serial fashion, i.e. both operands being entered serially (G06F 7/533 takes precedence) **[2006.01]**

7/527 • • • • • in serial-parallel fashion, i.e. one operand being entered serially and the other in parallel (G06F 7/533 takes precedence) **[2006.01]**

7/53 • • • • • in parallel-parallel fashion, i.e. both operands being entered in parallel (G06F 7/533 takes precedence) **[2006.01]**

7/533 • • • • • Reduction of the number of iteration steps or stages, e.g. using the Booth algorithm, log-sum, odd-even **[2006.01]**

7/535 • • • • Dividing only **[2006.01]**

7/537 • • • • • Reduction of the number of iteration steps or stages, e.g. using the Sweeny-Robertson-Tocher [SRT] algorithm **[2006.01]**

7/544 • • • for evaluating functions by calculation **[3, 2006.01]**

7/548 • • • • Trigonometric functions; Co-ordinate transformations **[3, 2006.01]**

7/552 • • • • Powers or roots **[3, 2006.01]**

7/556 • • • • Logarithmic or exponential functions **[3, 2006.01]**

7/57 • • • Arithmetic logic units [ALU], i.e. arrangements or devices for performing two or more of the operations covered by groups G06F 7/483-G06F 7/556 or for performing logical operations **[2006.01]**

7/575 • • • • Basic arithmetic logic units, i.e. devices selectable to perform either addition, subtraction or one of several logical operations, using, at least partially, the same circuitry **[2006.01]**

7/58 • Random or pseudo-random number generators **[3, 2006.01]**

7/60 • Methods or arrangements for performing computations using a digital non-denominational number representation, i.e. number representation without radix; Computing devices using combinations of denominational and non-denominational quantity representations **[3, 2006.01]**

7/62 • • Performing operations exclusively by counting total number of pulses **[3, 2006.01]**

7/64 • • Digital differential analysers, i.e. computing devices for differentiation, integration or solving differential or integral equations, using pulses representing increments; Other incremental computing devices for solving difference equations (G06F 7/70 takes precedence; differential analysers using hybrid computing techniques G06J 1/02) **[3, 2006.01]**

7/66 • • • wherein pulses represent unitary increments only **[3, 2006.01]**

7/68 • • using pulse rate multipliers or dividers (G06F 7/70 takes precedence) **[3, 2006.01]**

7/70 • • using stochastic pulse trains, i.e. randomly occurring pulses the average pulse rates of which represent numbers **[3, 2006.01]**

7/72 • • using residue arithmetic **[3, 2006.01]**

7/74 • Selecting or encoding within a word the position of one or more bits having a specified value, e.g. most or least significant one or zero detection, priority encoders **[2006.01]**

7/76 • Arrangements for rearranging, permuting or selecting data according to predetermined rules, independently of the content of the data **[2006.01]**

7/78 • • for changing the order of data flow, e.g. matrix transposition, LIFO buffers; Overflow or underflow handling therefor **[2006.01]**

8/00 Arrangements for software engineering (testing or debugging G06F 11/36; administrative, planning or organisation aspects of software project management G06Q 10/06) **[2018.01]**

8/10 • Requirements analysis; Specification techniques **[2018.01]**

8/20 • Software design **[2018.01]**

8/30 • Creation or generation of source code **[2018.01]**

8/33 • • Intelligent editors **[2018.01]**

8/34 • • Graphical or visual programming **[2018.01]**

8/35 • • model driven **[2018.01]**

8/36 • • Software reuse **[2018.01]**

8/38 • • for implementing user interfaces **[2018.01]**

8/40 • Transformation of program code **[2018.01]**

8/41 • • Compilation **[2018.01]**

8/51 • • Source to source **[2018.01]**

8/52 • • Binary to binary **[2018.01]**

8/53 • • Decompilation; Disassembly **[2018.01]**

8/54 • • Link editing before load time **[2018.01]**

8/60 • Software deployment **[2018.01]**

8/61 • • Installation **[2018.01]**

8/65 • • Updates (security arrangements therefor G06F 21/57) **[2018.01]**

8/654 • • • using techniques specially adapted for alterable solid state memories, e.g. for EEPROM or flash memories **[2018.01]**

8/656 • • • while running **[2018.01]**

8/658 • • • Incremental updates; Differential updates **[2018.01]**

8/70 • Software maintenance or management **[2018.01]**

8/71 • • Version control (security arrangements therefor G06F 21/57); Configuration management **[2018.01]**

8/72 • • Code refactoring **[2018.01]**

8/73 • • Program documentation **[2018.01]**

8/74 • • Reverse engineering; Extracting design information from source code **[2018.01]**

8/75 • • Structural analysis for program understanding **[2018.01]**

8/76 • • Adapting program code to run in a different environment; Porting **[2018.01]**

8/77 • • Software metrics **[2018.01]**

9/00 Arrangements for program control, e.g. control units (program control for peripheral devices G06F 13/10) **[1, 4, 2006.01, 2018.01]**

9/02 • using wired connections, e.g. plugboards **[1, 2006.01]**

9/04 • using record carriers containing only program instructions (G06F 9/06 takes precedence) **[1, 2006.01]**

9/06 • using stored programs, i.e. using an internal store of processing equipment to receive or retain programs **[1, 2006.01]**

9/22 • • Microcontrol or microprogram arrangements **[3, 2006.01]**

9/24 • • • Loading of the microprogram **[3, 2006.01]**

9/26 • • • Address formation of the next microinstruction (G06F 9/28 takes precedence) **[3, 2006.01]**

9/28 • • • Enhancement of operational speed, e.g. by using several microcontrol devices operating in parallel **[3, 2006.01]**

9/30 • • Arrangements for executing machine instructions, e.g. instruction decode (for executing microinstructions G06F 9/22) **[3, 2006.01, 2018.01]**

9/302 • • • Controlling the executing of arithmetic operations **[5, 2006.01, 2018.01]**

9/305 • • • Controlling the executing of logical operations **[5, 2006.01, 2018.01]**

9/308 • • • Controlling single bit operations (G06F 9/305 takes precedence) **[5, 2006.01, 2018.01]**

9/312 • • • Controlling loading, storing or clearing operations **[5, 2006.01, 2018.01]**

9/315 • • • Controlling moving, shifting or rotation operations **[5, 2006.01, 2018.01]**

9/318 • • • with operation extension or modification **[5, 2006.01, 2018.01]**

9/32 • • • Address formation of the next instruction, e.g. by incrementing the instruction counter (G06F 9/38 takes precedence) **[3, 2006.01, 2018.01]**

9/34 • • • Addressing or accessing the instruction operand or the result **[3, 5, 2006.01, 2018.01]**

9/345 • • • • of multiple operands or results **[5, 2006.01, 2018.01]**

9/35 • • • • Indirect addressing **[5, 2006.01, 2018.01]**

9/355 • • • • Indexed addressing **[5, 2006.01, 2018.01]**

9/38 • • • Concurrent instruction execution, e.g. pipeline, look ahead **[3, 2006.01, 2018.01]**

9/44 • • Arrangements for executing specific programs **[3, 2006.01, 2018.01]**

9/4401 • • • Bootstrapping (security arrangements therefor G06F 21/57) **[2018.01]**

9/445 • • • Program loading or initiating (bootstrapping G06F 9/4401; security arrangements for program loading or initiating G06F 21/57) **[5, 2006.01, 2018.01]**

9/448 • • • Execution paradigms, e.g. implementations of programming paradigms **[2018.01]**

9/451 • • • Execution arrangements for user interfaces **[2018.01]**

9/455 • • • Emulation; Interpretation; Software simulation, e.g. virtualisation or emulation of application or operating system execution engines **[5, 2006.01, 2018.01]**

9/46 • • Multiprogramming arrangements **[3, 2006.01]**

9/48 • • • Program initiating; Program switching, e.g. by interrupt **[7, 2006.01]**

9/50 • • • Allocation of resources, e.g. of the central processing unit [CPU] **[7, 2006.01]**

9/52 • • • Program synchronisation; Mutual exclusion, e.g. by means of semaphores **[7, 2006.01]**

9/54 • • • Interprogram communication **[7, 2006.01]**

11/00 **Error detection; Error correction; Monitoring** (error detection, correction or monitoring in information storage based on relative movement between record carrier and transducer G11B 20/18; monitoring, i.e. supervising the progress of recording or reproducing G11B 27/36; in static stores G11C 29/00) **[1, 4, 2006.01]**

11/07 • Responding to the occurrence of a fault, e.g. fault tolerance **[7, 2006.01]**

11/08 • • Error detection or correction by redundancy in data representation, e.g. by using checking codes **[1, 2006.01]**

11/10 • • • Adding special bits or symbols to the coded information, e.g. parity check, casting out nines or elevens **[1, 2006.01]**

11/14 • • Error detection or correction of the data by redundancy in operation, e.g. by using different operation sequences leading to the same result (G06F 11/16 takes precedence) **[3, 2006.01]**

11/16 • • Error detection or correction of the data by redundancy in hardware **[3, 2006.01]**

11/18 • • • using passive fault-masking of the redundant circuits, e.g. by quadding or by majority decision circuits **[3, 2006.01]**

11/20 • • • using active fault-masking, e.g. by switching out faulty elements or by switching in spare elements **[3, 2006.01]**

11/22 • Detection or location of defective computer hardware by testing during standby operation or during idle time, e.g. start-up testing **[3, 2006.01]**

11/24 • • Marginal testing **[3, 2006.01]**

11/25 • • Testing of logic operation, e.g. by logic analysers **[6, 2006.01]**

11/26 • • Functional testing **[3, 2006.01]**

11/263 • • • Generation of test inputs, e.g. test vectors, patterns or sequences **[6, 2006.01]**

11/267 • • • Reconfiguring circuits for testing, e.g. LSSD, partitioning **[6, 2006.01]**

11/27 • • • Built-in tests **[6, 2006.01]**

11/273 • • • Tester hardware, i.e. output processing circuits **[6, 2006.01]**

11/277 • • • • with comparison between actual response and known fault-free response **[6, 2006.01]**

11/28 • by checking the correct order of processing (G06F 11/07, G06F 11/22 take precedence) **[3, 2006.01]**

11/30 • Monitoring **[3, 2006.01]**

11/32 • • with visual indication of the functioning of the machine **[3, 2006.01]**

11/34 • • Recording or statistical evaluation of computer activity, e.g. of down time, of input/output operation **[3, 2006.01]**

11/36 • Preventing errors by testing or debugging of software **[7, 2006.01]**

12/00 **Accessing, addressing or allocating within memory systems or architectures** (digital input from, or digital output to record carriers, e.g. to disk storage units, G06F 3/06) **[4, 5, 2006.01]**

12/02 • Addressing or allocation; Relocation (program address sequencing G06F 9/00; arrangements for selecting an address in a digital store G11C 8/00) **[4, 2006.01]**

12/04 • • Addressing variable-length words or parts of words **[4, 2006.01]**

12/06 • • Addressing a physical block of locations, e.g. base addressing, module addressing, address space extension, memory dedication (G06F 12/08 takes precedence) **[4, 2006.01]**

12/08 • • in hierarchically structured memory systems, e.g. virtual memory systems **[4, 2006.01, 2016.01]**

12/0802 • • • Addressing of a memory level in which the access to the desired data or data block requires associative addressing means, e.g. caches **[2016.01]**

12/0804 • • • • with main memory updating (G06F 12/0806 takes precedence) **[2016.01]**

12/0806 • • • • Multiuser, multiprocessor or multiprocessing cache systems **[2016.01]**

12/0808 • • • • • with cache invalidating means (G06F 12/0815 takes precedence) **[2016.01]**

12/0811 • • • • • with multilevel cache hierarchies **[2016.01]**

12/0813 • • • • • with a network or matrix configuration **[2016.01]**

12/0815 • • • • • Cache consistency protocols **[2016.01]**

12/0817 • • • • • • using directory methods **[2016.01]**

12/0831 • • • • • • using a bus scheme, e.g. with bus monitoring or watching means **[2016.01]**

12/0837 • • • • • • with software control, e.g. non-cacheable data **[2016.01]**

12/084 • • • • • with a shared cache **[2016.01]**

12/0842 • • • • • for multiprocessing or multitasking **[2016.01]**

12/0844 • • • • Multiple simultaneous or quasi-simultaneous cache accessing **[2016.01]**

12/0846 • • • • • Cache with multiple tag or data arrays being simultaneously accessible **[2016.01]**

12/0853 • • • • • Cache with multiport tag or data arrays **[2016.01]**

12/0855 • • • • • Overlapped cache accessing, e.g. pipeline (G06F 12/0846 takes precedence) **[2016.01]**

12/0862 • • • • with prefetch **[2016.01]**

12/0864 • • • • using pseudo-associative means, e.g. set-associative or hashing **[2016.01]**

12/0866 • • • • for peripheral storage systems, e.g. disk cache **[2016.01]**

12/0868 • • • • • Data transfer between cache memory and other subsystems, e.g. storage devices or host systems **[2016.01]**

12/0871 • • • • • Allocation or management of cache space **[2016.01]**

12/0873 • • • • • Mapping of cache memory to specific storage devices or parts thereof **[2016.01]**

12/0875 • • • • with dedicated cache, e.g. instruction or stack **[2016.01]**

12/0877 • • • • Cache access modes **[2016.01]**

12/0879 • • • • • Burst mode **[2016.01]**

12/0882 • • • • • Page mode **[2016.01]**

12/0884 • • • • • Parallel mode, e.g. in parallel with main memory or CPU **[2016.01]**

12/0886 • • • • • Variable-length word access **[2016.01]**

12/0888 • • • • using selective caching, e.g. bypass **[2016.01]**
12/0891 • • • • using clearing, invalidating or resetting means **[2016.01]**
12/0893 • • • • Caches characterised by their organisation or structure **[2016.01]**
12/0895 • • • • • of parts of caches, e.g. directory or tag array **[2016.01]**
12/0897 • • • • • with two or more cache hierarchy levels (with multilevel cache hierarchies G06F 12/0811) **[2016.01]**
12/10 • • • Address translation **[4, 2006.01, 2016.01]**
12/1009 • • • • using page tables, e.g. page table structures **[2016.01]**
12/1018 • • • • • involving hashing techniques, e.g. inverted page tables **[2016.01]**
12/1027 • • • • using associative or pseudo-associative address translation means, e.g. translation look-aside buffer [TLB] **[2016.01]**
12/1036 • • • • • for multiple virtual address spaces, e.g. segmentation (G06F 12/1045 takes precedence) **[2016.01]**
12/1045 • • • • • associated with a data cache **[2016.01]**
12/1072 • • • • Decentralised address translation, e.g. in distributed shared memory systems **[2016.01]**
12/1081 • • • • for peripheral access to main memory, e.g. direct memory access [DMA] **[2016.01]**
12/109 • • • • for multiple virtual address spaces, e.g. segmentation (G06F 12/1036 takes precedence) **[2016.01]**
12/12 • • • Replacement control **[4, 2006.01, 2016.01]**
12/121 • • • • using replacement algorithms **[2016.01]**
12/122 • • • • • of the least frequently used [LFU] type, e.g. with individual count value **[2016.01]**
12/123 • • • • • with age lists, e.g. queue, most recently used [MRU] list or least recently used [LRU] list **[2016.01]**
12/126 • • • • • with special data handling, e.g. priority of data or instructions, handling errors or pinning **[2016.01]**
12/127 • • • • • • using additional replacement algorithms **[2016.01]**
12/128 • • • • • adapted to multidimensional cache systems, e.g. set-associative, multicache, multiset or multilevel **[2016.01]**
12/14 • Protection against unauthorised use of memory **[4, 2006.01]**
12/16 • Protection against loss of memory contents **[4, 2006.01]**

13/00 Interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units (interface circuits for specific input/output devices G06F 3/00; multi-processor systems G06F 15/16) **[1, 4, 2006.01]**

13/10 • Program control for peripheral devices (G06F 13/14-G06F 13/42 take precedence) **[4, 2006.01]**
13/12 • • using hardware independent of the central processor, e.g. channel or peripheral processor **[4, 2006.01]**
13/14 • Handling requests for interconnection or transfer **[4, 2006.01]**
13/16 • • for access to memory bus (G06F 13/28 takes precedence) **[4, 2006.01]**
13/18 • • • with priority control **[4, 2006.01]**
13/20 • • for access to input/output bus **[4, 2006.01]**
13/22 • • • using successive scanning, e.g. polling (G06F 13/24 takes precedence) **[4, 2006.01]**
13/24 • • • using interrupt (G06F 13/32 takes precedence) **[4, 2006.01]**
13/26 • • • • with priority control **[4, 2006.01]**
13/28 • • • using burst mode transfer, e.g. direct memory access, cycle steal (G06F 13/32 takes precedence) **[4, 2006.01]**
13/30 • • • • with priority control **[4, 2006.01]**
13/32 • • • using combination of interrupt and burst mode transfer **[4, 2006.01]**
13/34 • • • • with priority control **[4, 2006.01]**
13/36 • • for access to common bus or bus system **[4, 2006.01]**
13/362 • • • with centralised access control **[5, 2006.01]**
13/364 • • • • using independent requests or grants, e.g. using separated request and grant lines **[5, 2006.01]**
13/366 • • • • using a centralised polling arbiter **[5, 2006.01]**
13/368 • • • with decentralised access control **[5, 2006.01]**
13/37 • • • • using a physical-position-dependent priority, e.g. daisy chain, round robin or token passing **[5, 2006.01]**
13/372 • • • • using a time-dependent priority, e.g. individually loaded time counters or time slot **[5, 2006.01]**
13/374 • • • • using a self-select method with individual priority code comparator **[5, 2006.01]**
13/376 • • • • using a contention resolving method, e.g. collision detection, collision avoidance **[5, 2006.01]**
13/378 • • • • using a parallel poll method **[5, 2006.01]**
13/38 • Information transfer, e.g. on bus (G06F 13/14 takes precedence) **[4, 2006.01]**
13/40 • • Bus structure **[4, 2006.01]**
13/42 • • Bus transfer protocol, e.g. handshake; Synchronisation **[4, 2006.01]**

15/00 Digital computers in general (details G06F 1/00-G06F 13/00)**; Data processing equipment in general [1, 2006.01]**

15/02 • manually operated with input through keyboard and computation using a built-in program, e.g. pocket calculators **[1, 2006.01]**
15/04 • programmed simultaneously with the introduction of data to be processed, e.g. on the same record carrier **[1, 2006.01]**
15/08 • using a plugboard for programming **[1, 5, 2006.01]**
15/10 • • Tabulators **[1, 5, 2006.01]**
15/12 • • • having provision for both printed and punched output **[1, 5, 2006.01]**
15/14 • • Calculating-punches **[1, 5, 2006.01]**
15/16 • Combinations of two or more digital computers each having at least an arithmetic unit, a program unit and a register, e.g. for a simultaneous processing of several programs **[1, 2006.01]**
15/163 • • Interprocessor communication **[6, 2006.01]**
15/167 • • • using a common memory, e.g. mailbox **[6, 2006.01]**
15/17 • • • using an input/output type connection, e.g. channel, I/O port **[6, 2006.01]**
15/173 • • • using an interconnection network, e.g. matrix, shuffle, pyramid, star or snowflake **[6, 2006.01]**
15/177 • • Initialisation or configuration control (configuration control for monitoring, testing or in case of failure G06F 11/00) **[6, 2006.01]**

15/76 • Architectures of general purpose stored program computers (with program plugboard G06F 15/08; multicomputers G06F 15/16) **[5, 6, 2006.01]**

15/78 • • comprising a single central processing unit **[5, 2006.01]**

15/80 • • comprising an array of processing units with common control, e.g. single instruction multiple data processors (G06F 15/82 takes precedence) **[5, 2006.01]**

15/82 • • data or demand driven **[5, 2006.01]**

16/00 Information retrieval; Database structures therefor; File system structures therefor [2019.01]

16/10 • File systems; File servers **[2019.01]**

16/11 • • File system administration, e.g. details of archiving or snapshots (file system backup G06F 11/14) **[2019.01]**

16/13 • • File access structures, e.g. distributed indices (arrangements of input from, or output to, record carriers G06F 3/06) **[2019.01]**

16/14 • • Details of searching files based on file metadata **[2019.01]**

16/16 • • File or folder operations, e.g. details of user interfaces specifically adapted to file systems **[2019.01]**

16/17 • • Details of further file system functions **[2019.01]**

16/172 • • • Caching, prefetching or hoarding of files **[2019.01]**

16/174 • • • Redundancy elimination performed by the file system (management of the data involved in backup or backup restore using de-duplication of the data G06F 11/14) **[2019.01]**

16/176 • • • Support for shared access to files; File sharing support **[2019.01]**

16/178 • • • Techniques for file synchronisation in file systems **[2019.01]**

16/18 • • File system types **[2019.01]**

16/182 • • • Distributed file systems **[2019.01]**

16/185 • • • Hierarchical storage management [HSM] systems, e.g. file migration or policies thereof (details of archiving G06F 16/11) **[2019.01]**

16/188 • • • Virtual file systems **[2019.01]**

16/20 • of structured data, e.g. relational data **[2019.01]**

16/21 • • Design, administration or maintenance of databases **[2019.01]**

16/215 • • • Improving data quality; Data cleansing, e.g. de-duplication, removing invalid entries or correcting typographical errors **[2019.01]**

16/22 • • Indexing; Data structures therefor; Storage structures **[2019.01]**

16/23 • • Updating **[2019.01]**

16/24 • • Querying **[2019.01]**

16/242 • • • Query formulation **[2019.01]**

16/245 • • • Query processing **[2019.01]**

16/2452 • • • • Query translation **[2019.01]**

16/2453 • • • • Query optimisation **[2019.01]**

16/2455 • • • • Query execution **[2019.01]**

16/2457 • • • • with adaptation to user needs **[2019.01]**

16/2458 • • • • Special types of queries, e.g. statistical queries, fuzzy queries or distributed queries **[2019.01]**

16/248 • • • Presentation of query results **[2019.01]**

16/25 • • Integrating or interfacing systems involving database management systems **[2019.01]**

16/26 • • Visual data mining; Browsing structured data **[2019.01]**

16/27 • • Replication, distribution or synchronisation of data between databases or within a distributed database system; Distributed database system architectures therefor **[2019.01]**

16/28 • • Databases characterised by their database models, e.g. relational or object models **[2019.01]**

16/29 • • Geographical information databases **[2019.01]**

16/30 • of unstructured textual data (document management systems G06F 16/93) **[2019.01]**

Note(s) [2019.01]

In groups G06F 16/30-G06F 16/36, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/38-G06F 16/387.

16/31 • • Indexing; Data structures therefor; Storage structures **[2019.01]**

16/33 • • Querying **[2019.01]**

16/332 • • • Query formulation **[2019.01]**

16/335 • • • Filtering based on additional data, e.g. user or group profiles (filtering in web context G06F 16/9535, G06F 16/9536) **[2019.01]**

16/338 • • • Presentation of query results **[2019.01]**

16/34 • • Browsing; Visualisation therefor **[2019.01]**

16/35 • • Clustering; Classification **[2019.01]**

16/36 • • Creation of semantic tools, e.g. ontology or thesauri **[2019.01]**

16/38 • • Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually **[2019.01]**

16/383 • • • using metadata automatically derived from the content **[2019.01]**

16/387 • • • using geographical or spatial information, e.g. location **[2019.01]**

16/40 • of multimedia data, e.g. slideshows comprising image and additional audio data (retrieval of still image data G06F 16/50; retrieval of audio data G06F 16/60; retrieval of video data G06F 16/70) **[2019.01]**

Note(s) [2019.01]

In groups G06F 16/40-G06F 16/45, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/48-G06F 16/487.

16/41 • • Indexing; Data structures therefor; Storage structures **[2019.01]**

16/43 • • Querying **[2019.01]**

16/432 • • • Query formulation **[2019.01]**

16/435 • • • Filtering based on additional data, e.g. user or group profiles **[2019.01]**

16/438 • • • Presentation of query results **[2019.01]**

16/44 • • Browsing; Visualisation therefor **[2019.01]**

16/45 • • Clustering; Classification **[2019.01]**

16/48 • • Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually **[2019.01]**

16/483 • • • using metadata automatically derived from the content **[2019.01]**

16/487 • • • using geographical or spatial information, e.g. location **[2019.01]**

16/50 • of still image data **[2019.01]**

Note(s) [2019.01]

In groups G06F 16/50-G06F 16/56, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/58-G06F 16/587.

16/51 • • Indexing; Data structures therefor; Storage structures **[2019.01]**
16/53 • • Querying **[2019.01]**
16/532 • • • Query formulation, e.g. graphical querying **[2019.01]**
16/535 • • • Filtering based on additional data, e.g. user or group profiles **[2019.01]**
16/538 • • • Presentation of query results **[2019.01]**
16/54 • • Browsing; Visualisation therefor **[2019.01]**
16/55 • • Clustering; Classification **[2019.01]**
16/56 • • having vectorial format **[2019.01]**
16/58 • • Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually **[2019.01]**
16/583 • • • using metadata automatically derived from the content **[2019.01]**
16/587 • • • using geographical or spatial information, e.g. location **[2019.01]**
16/60 • of audio data **[2019.01]**

Note(s) [2019.01]

In groups G06F 16/60-G06F 16/65, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/68-G06F 16/687.

16/61 • • Indexing; Data structures therefor; Storage structures **[2019.01]**
16/63 • • Querying **[2019.01]**
16/632 • • • Query formulation **[2019.01]**
16/635 • • • Filtering based on additional data, e.g. user or group profiles **[2019.01]**
16/638 • • • Presentation of query results **[2019.01]**
16/64 • • Browsing; Visualisation therefor (generation of a list or set of audio data G06F 16/638) **[2019.01]**
16/65 • • Clustering; Classification **[2019.01]**
16/68 • • Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually **[2019.01]**
16/683 • • • using metadata automatically derived from the content **[2019.01]**
16/687 • • • using geographical or spatial information, e.g. location **[2019.01]**
16/70 • of video data **[2019.01]**

Note(s) [2019.01]

In groups G06F 16/70-G06F 16/75, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/78-G06F 16/787.

16/71 • • Indexing; Data structures therefor; Storage structures **[2019.01]**
16/73 • • Querying **[2019.01]**
16/732 • • • Query formulation **[2019.01]**
16/735 • • • Filtering based on additional data, e.g. user or group profiles **[2019.01]**
16/738 • • • Presentation of query results **[2019.01]**
16/74 • • Browsing; Visualisation therefor (end-user interfaces for requesting or interacting with video content, e.g. video on demand interfaces or electronic program guides, H04N 21/472) **[2019.01]**
16/75 • • Clustering; Classification **[2019.01]**
16/78 • • Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually **[2019.01]**
16/783 • • • using metadata automatically derived from the content **[2019.01]**
16/787 • • • using geographical or spatial information, e.g. location **[2019.01]**
16/80 • of semi-structured data, e.g. markup language structured data such as SGML, XML or HTML (content-based retrieval of web data G06F 16/95) **[2019.01]**
16/81 • • Indexing, e.g. XML tags; Data structures therefor; Storage structures **[2019.01]**
16/83 • • Querying **[2019.01]**
16/832 • • • Query formulation **[2019.01]**
16/835 • • • Query processing **[2019.01]**
16/838 • • • Presentation of query results **[2019.01]**
16/84 • • Mapping; Conversion **[2019.01]**
16/90 • Details of database functions independent of the retrieved data types **[2019.01]**

Note(s) [2019.01]

In groups G06F 16/90-G06F 16/906, subject matter relevant to retrieval characterised by using metadata, when it is determined to be novel and non-obvious, must also be classified in groups G06F 16/907-G06F 16/909.

16/901 • • Indexing; Data structures therefor; Storage structures (for retrieval from the web G06F 16/951) **[2019.01]**
16/903 • • Querying (for retrieval from the web G06F 16/953) **[2019.01]**
16/9032 • • • Query formulation **[2019.01]**
16/9035 • • • Filtering based on additional data, e.g. user or group profiles **[2019.01]**
16/9038 • • • Presentation of query results **[2019.01]**
16/904 • • Browsing; Visualisation therefor (for navigating the web G06F 16/954; browsing optimisation for the web G06F 16/957) **[2019.01]**
16/906 • • Clustering; Classification **[2019.01]**
16/907 • • Retrieval characterised by using metadata, e.g. metadata not derived from the content or metadata generated manually **[2019.01]**
16/908 • • • using metadata automatically derived from the content **[2019.01]**
16/909 • • • using geographical or spatial information, e.g. location (spatial or temporal dependent retrieval from the web G06F 16/9537) **[2019.01]**
16/93 • • Document management systems **[2019.01]**
16/95 • • Retrieval from the web **[2019.01]**
16/951 • • • Indexing; Web crawling techniques **[2019.01]**
16/953 • • • Querying, e.g. by the use of web search engines **[2019.01]**
16/9532 • • • • Query formulation **[2019.01]**
16/9535 • • • • Search customisation based on user profiles and personalisation **[2019.01]**
16/9536 • • • • Search customisation based on social or collaborative filtering **[2019.01]**
16/9537 • • • • Spatial or temporal dependent retrieval, e.g. spatiotemporal queries **[2019.01]**
16/9538 • • • • Presentation of query results **[2019.01]**

16/954 • • • Navigation, e.g. using categorised browsing **[2019.01]**

16/955 • • • using information identifiers, e.g. uniform resource locators [URL] **[2019.01]**

16/957 • • • Browsing optimisation, e.g. caching or content distillation **[2019.01]**

16/958 • • • Organisation or management of web site content, e.g. publishing, maintaining pages or automatic linking **[2019.01]**

17/00 Digital computing or data processing equipment or methods, specially adapted for specific functions (information retrieval, database structures or file system structures therefor G06F 16/00) **[6, 2006.01, 2019.01]**

17/10 • Complex mathematical operations **[6, 2006.01]**

17/11 • • for solving equations **[6, 2006.01]**

17/12 • • • Simultaneous equations **[6, 2006.01]**

17/13 • • • Differential equations (using digital differential analysers G06F 7/64) **[6, 2006.01]**

17/14 • • Fourier, Walsh or analogous domain transformations **[6, 2006.01]**

17/15 • • Correlation function computation **[6, 2006.01]**

17/16 • • Matrix or vector computation **[6, 2006.01]**

17/17 • • Function evaluation by approximation methods, e.g. interpolation or extrapolation, smoothing or least mean square method **[6, 2006.01]**

17/18 • • for evaluating statistical data **[6, 2006.01]**

17/40 • Data acquisition and logging (for input to computer G06F 3/00) **[6, 2006.01]**

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

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

Note(s) [2013.01]

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

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

21/12 • • Protecting executable software **[2013.01]**

21/14 • • • against software analysis or reverse engineering, e.g. by obfuscation **[2013.01]**

21/16 • • Program or content traceability, e.g. by watermarking **[2013.01]**

21/30 • Authentication, i.e. establishing the identity or authorisation of security principals **[2013.01]**

21/31 • • User authentication **[2013.01]**

21/32 • • • using biometric data, e.g. fingerprints, iris scans or voiceprints **[2013.01]**

21/33 • • • using certificates **[2013.01]**

21/34 • • • involving the use of external additional devices, e.g. dongles or smart cards **[2013.01]**

21/35 • • • • communicating wirelessly **[2013.01]**

21/36 • • • by graphic or iconic representation **[2013.01]**

21/40 • • • by quorum, i.e. whereby two or more security principals are required **[2013.01]**

21/41 • • • where a single sign-on provides access to a plurality of computers **[2013.01]**

21/42 • • • using separate channels for security data **[2013.01]**

21/43 • • • • wireless channels **[2013.01]**

21/44 • • Program or device authentication **[2013.01]**

21/45 • • Structures or tools for the administration of authentication **[2013.01]**

21/46 • • • by designing passwords or checking the strength of passwords **[2013.01]**

21/50 • Monitoring users, programs or devices to maintain the integrity of platforms, e.g. of processors, firmware or operating systems **[2013.01]**

21/51 • • at application loading time, e.g. accepting, rejecting, starting or inhibiting executable software based on integrity or source reliability **[2013.01]**

21/52 • • during program execution, e.g. stack integrity, buffer overflow or preventing unwanted data erasure **[2013.01]**

21/53 • • • by executing in a restricted environment, e.g. sandbox or secure virtual machine **[2013.01]**

21/54 • • • by adding security routines or objects to programs **[2013.01]**

21/55 • • Detecting local intrusion or implementing counter-measures **[2013.01]**

21/56 • • • Computer malware detection or handling, e.g. anti-virus arrangements **[2013.01]**

21/57 • • Certifying or maintaining trusted computer platforms, e.g. secure boots or power-downs, version controls, system software checks, secure updates or assessing vulnerabilities **[2013.01]**

21/60 • Protecting data **[2013.01]**

21/62 • • Protecting access to data via a platform, e.g. using keys or access control rules **[2013.01]**

21/64 • • Protecting data integrity, e.g. using checksums, certificates or signatures **[2013.01]**

21/70 • Protecting specific internal or peripheral components, in which the protection of a component leads to protection of the entire computer **[2013.01]**

21/71 • • to assure secure computing or processing of information **[2013.01]**

21/72 • • • in cryptographic circuits **[2013.01]**

21/73 • • • by creating or determining hardware identification, e.g. serial numbers **[2013.01]**

21/74 • • • operating in dual or compartmented mode, i.e. at least one secure mode **[2013.01]**

21/75 • • • by inhibiting the analysis of circuitry or operation, e.g. to counteract reverse engineering **[2013.01]**

21/76 • • • in application-specific integrated circuits [ASICs] or field-programmable devices, e.g. field-programmable gate arrays [FPGAs] or programmable logic devices [PLDs] **[2013.01]**

21/77 • • • in smart cards **[2013.01]**

21/78 • • to assure secure storage of data (address-based protection against unauthorised use of memory G06F 12/14; record carriers for use with machines and with at least a part designed to carry digital markings G06K 19/00) **[2013.01]**

21/79 • • • in semiconductor storage media, e.g. directly-addressable memories **[2013.01]**

21/80 • • • in storage media based on magnetic or optical technology, e.g. disks with sectors (preventing unauthorised reproduction or copying of disc-type recordable media G11B 20/00) **[2013.01]**

21/81 • • by operating on the power supply, e.g. enabling or disabling power-on, sleep or resume operations **[2013.01]**

21/82 • • Protecting input, output or interconnection devices **[2013.01]**

21/83 • • • input devices, e.g. keyboards, mice or controllers thereof **[2013.01]**

21/84 • • • output devices, e.g. displays or monitors **[2013.01]**
21/85 • • • interconnection devices, e.g. bus-connected or in-line devices **[2013.01]**
21/86 • • Secure or tamper-resistant housings **[2013.01]**
21/87 • • • by means of encapsulation, e.g. for integrated circuits **[2013.01]**
21/88 • • Detecting or preventing theft or loss **[2013.01]**

30/00 Computer-aided design [CAD] [2020.01]

Note(s) [2020.01]

In this group, it is desirable to add the indexing codes of groups G06F 111/00-G06F 119/00.

30/10 • Geometric CAD **[2020.01]**
30/12 • • characterised by design entry means specially adapted for CAD, e.g. graphical user interfaces [GUI] specially adapted for CAD **[2020.01]**
30/13 • • Architectural design, e.g. computer-aided architectural design [CAAD] related to design of buildings, bridges, landscapes, production plants or roads **[2020.01]**
30/15 • • Vehicle, aircraft or watercraft design **[2020.01]**
30/17 • • Mechanical parametric or variational design **[2020.01]**
30/18 • • Network design, e.g. design based on topological or interconnect aspects of utility systems, piping, heating ventilation air conditioning [HVAC] or cabling (circuit design at the physical level G06F 30/39; network planning tools for wireless communication networks H04W 16/18) **[2020.01]**
30/20 • Design optimisation, verification or simulation (optimisation, verification or simulation of circuit designs G06F 30/30) **[2020.01]**
30/22 • • using Petri net models **[2020.01]**
30/23 • • using finite element methods [FEM] or finite difference methods [FDM] **[2020.01]**
30/25 • • using particle-based methods **[2020.01]**
30/27 • • using machine learning, e.g. artificial intelligence, neural networks, support vector machines [SVM] or training a model **[2020.01]**
30/28 • • using fluid dynamics, e.g. using Navier-Stokes equations or computational fluid dynamics [CFD] **[2020.01]**
30/30 • Circuit design **[2020.01]**
30/31 • • Design entry, e.g. editors specifically adapted for circuit design **[2020.01]**
30/32 • • Circuit design at the digital level (reconfigurable circuits G06F 30/34) **[2020.01]**
30/323 • • • Translation or migration, e.g. logic to logic, hardware description language [HDL] translation or netlist translation **[2020.01]**
30/327 • • • Logic synthesis; Behaviour synthesis, e.g. mapping logic, HDL to netlist, high-level language to RTL or netlist **[2020.01]**
30/33 • • • Design verification, e.g. functional simulation or model checking **[2020.01]**
30/3308 • • • • using simulation **[2020.01]**
30/331 • • • • • with hardware acceleration, e.g. by using field programmable gate array [FPGA] or emulation **[2020.01]**
30/3312 • • • • • Timing analysis **[2020.01]**
30/3315 • • • • using static timing analysis [STA] **[2020.01]**
30/3323 • • • • using formal methods, e.g. equivalence checking or property checking **[2020.01]**
30/333 • • • Design for testability [DFT], e.g. scan chain or built-in self-test [BIST] **[2020.01]**
30/337 • • • Design optimisation **[2020.01]**
30/34 • • for reconfigurable circuits, e.g. field programmable gate arrays [FPGA] or programmable logic devices [PLD] **[2020.01]**
30/343 • • • Logical level **[2020.01]**
30/347 • • • Physical level, e.g. placement or routing **[2020.01]**
30/35 • • Delay-insensitive circuit design, e.g. asynchronous or self-timed **[2020.01]**
30/36 • • Circuit design at the analogue level **[2020.01]**
30/367 • • • Design verification, e.g. using simulation, simulation program with integrated circuit emphasis [SPICE], direct methods or relaxation methods **[2020.01]**
30/373 • • • Design optimisation **[2020.01]**
30/38 • • Circuit design at the mixed level of analogue and digital signals **[2020.01]**
30/39 • • Circuit design at the physical level (physical level design for reconfigurable circuits G06F 30/347) **[2020.01]**
30/392 • • • Floor-planning or layout, e.g. partitioning or placement **[2020.01]**
30/394 • • • Routing (G06F 30/396 takes precedence) **[2020.01]**
30/3947 • • • • global **[2020.01]**
30/3953 • • • • detailed **[2020.01]**
30/396 • • • Clock trees **[2020.01]**
30/398 • • • Design verification or optimisation, e.g. using design rule check [DRC], layout versus schematics [LVS] or finite element methods [FEM] (optical proximity correction [OPC] design processes G03F 1/36) **[2020.01]**

40/00 Handling natural language data (speech analysis or synthesis, speech recognition G10L) **[2020.01]**

40/10 • Text processing (natural language analysis G06F 40/20; semantic analysis G06F 40/30; processing or translation of natural language G06F 40/40) **[2020.01]**
40/103 • • Formatting, i.e. changing of presentation of documents (automatic justification G06F 40/189; automatic line break hyphenation G06F 40/191) **[2020.01]**
40/106 • • • Display of layout of documents; Previewing **[2020.01]**
40/109 • • • Font handling; Temporal or kinetic typography **[2020.01]**
40/111 • • • Mathematical or scientific formatting; Subscripts; Superscripts **[2020.01]**
40/114 • • • Pagination **[2020.01]**
40/117 • • • Tagging; Marking up (details of markup languages G06F 40/143); Designating a block; Setting of attributes (style sheets, e.g. eXtensible Stylesheet Language Transformation [XSLT], G06F 40/154) **[2020.01]**
40/12 • • Use of codes for handling textual entities **[2020.01]**
40/123 • • • Storage facilities **[2020.01]**
40/126 • • • Character encoding **[2020.01]**
40/129 • • • • Handling non-Latin characters, e.g. kana-to-kanji conversion **[2020.01]**
40/131 • • • Fragmentation of text files, e.g. creating reusable text-blocks; Linking to fragments, e.g. using XInclude; Namespaces **[2020.01]**
40/134 • • • Hyperlinking **[2020.01]**
40/137 • • • Hierarchical processing, e.g. outlines **[2020.01]**

40/14 • • • Tree-structured documents (parsing G06F 40/205; validation G06F 40/226) **[2020.01]**
40/143 • • • • Markup, e.g. Standard Generalized Markup Language [SGML] or Document Type Definition [DTD] **[2020.01]**
40/146 • • • • Coding or compression of tree-structured data **[2020.01]**
40/149 • • • Adaptation of the text data for streaming purposes, e.g. Efficient XML Interchange [EXI] format **[2020.01]**
40/151 • • • Transformation **[2020.01]**
40/154 • • • • Tree transformation for tree-structured or markup documents, e.g. XSLT, XSL-FO or stylesheets **[2020.01]**
40/157 • • • • using dictionaries or tables **[2020.01]**
40/16 • • • • Automatic learning of transformation rules, e.g. from examples **[2020.01]**
40/163 • • • Handling of whitespace **[2020.01]**
40/166 • • Editing, e.g. inserting or deleting **[2020.01]**
40/169 • • • Annotation, e.g. comment data or footnotes **[2020.01]**
40/171 • • • by use of digital ink **[2020.01]**
40/174 • • • Form filling; Merging **[2020.01]**
40/177 • • • of tables; using ruled lines **[2020.01]**
40/18 • • • • of spreadsheets (form-filling G06F 40/174) **[2020.01]**
40/183 • • • Tabulation, i.e. one-dimensional positioning **[2020.01]**
40/186 • • • Templates **[2020.01]**
40/189 • • Automatic justification **[2020.01]**
40/191 • • Automatic line break hyphenation **[2020.01]**
40/194 • • Calculation of difference between files **[2020.01]**
40/197 • • Version control (for software G06F 8/71) **[2020.01]**
40/20 • Natural language analysis (semantic analysis of natural language G06F 40/30) **[2020.01]**
40/205 • • Parsing **[2020.01]**
40/211 • • • Syntactic parsing, e.g. based on context-free grammar [CFG] or unification grammars **[2020.01]**
40/216 • • • using statistical methods **[2020.01]**
40/221 • • • Parsing markup language streams (streaming G06F 40/149) **[2020.01]**
40/226 • • • Validation **[2020.01]**
40/232 • • Orthographic correction, e.g. spell checking or vowelisation **[2020.01]**
40/237 • • Lexical tools **[2020.01]**
40/242 • • • Dictionaries **[2020.01]**
40/247 • • • Thesauruses; Synonyms **[2020.01]**
40/253 • • Grammatical analysis; Style critique **[2020.01]**
40/258 • • Heading extraction; Automatic titling; Numbering **[2020.01]**
40/263 • • Language identification **[2020.01]**
40/268 • • Morphological analysis **[2020.01]**
40/274 • • Converting codes to words; Guess-ahead of partial word inputs **[2020.01]**
40/279 • • Recognition of textual entities **[2020.01]**
40/284 • • • Lexical analysis, e.g. tokenisation or collocates **[2020.01]**
40/289 • • • Phrasal analysis, e.g. finite state techniques or chunking **[2020.01]**
40/295 • • • • Named entity recognition **[2020.01]**
40/30 • Semantic analysis **[2020.01]**
40/35 • • Discourse or dialogue representation **[2020.01]**
40/40 • Processing or translation of natural language (natural language analysis G06F 40/20; semantic analysis G06F 40/30) **[2020.01]**
40/42 • • Data-driven translation **[2020.01]**
40/44 • • • Statistical methods, e.g. probability models **[2020.01]**
40/45 • • • Example-based machine translation; Alignment **[2020.01]**
40/47 • • • Machine-assisted translation, e.g. using translation memory **[2020.01]**
40/49 • • • using very large corpora, e.g. the web **[2020.01]**
40/51 • • Translation evaluation **[2020.01]**
40/53 • • Processing of non-Latin text (kana-to-kanji conversion G06F 40/129; vowelisation G06F 40/232) **[2020.01]**
40/55 • • Rule-based translation **[2020.01]**
40/56 • • • Natural language generation **[2020.01]**
40/58 • • Use of machine translation, e.g. for multi-lingual retrieval, for server-side translation for client devices or for real-time translation **[2020.01]**

Indexing scheme associated with group G06F 30/00, relating to CAD techniques [2020.01]

111/00 Details relating to CAD techniques [2020.01]

111/02 • CAD in a network environment, e.g. collaborative CAD or distributed simulation **[2020.01]**
111/04 • Constraint-based CAD **[2020.01]**
111/06 • Multi-objective optimisation, e.g. Pareto optimisation using simulated annealing [SA], ant colony algorithms or genetic algorithms [GA] **[2020.01]**
111/08 • Probabilistic or stochastic CAD **[2020.01]**
111/10 • Numerical modelling **[2020.01]**
111/12 • Symbolic schematics **[2020.01]**
111/14 • related to nanotechnology **[2020.01]**
111/16 • Customisation or personalisation **[2020.01]**
111/18 • using virtual or augmented reality **[2020.01]**
111/20 • Configuration CAD, e.g. designing by assembling or positioning modules selected from libraries of predesigned modules **[2020.01]**

Indexing scheme associated with group G06F 30/00, relating to the application field [2020.01]

113/00 Details relating to the application field [2020.01]

113/02 • Data centres **[2020.01]**
113/04 • Power grid distribution networks **[2020.01]**
113/06 • Wind turbines or wind farms **[2020.01]**
113/08 • Fluids **[2020.01]**
113/10 • Additive manufacturing, e.g. 3D printing **[2020.01]**
113/12 • Cloth **[2020.01]**
113/14 • Pipes **[2020.01]**
113/16 • Cables, cable trees or wire harnesses **[2020.01]**
113/18 • Chip packaging **[2020.01]**
113/20 • Packaging, e.g. boxes or containers **[2020.01]**
113/22 • Moulding **[2020.01]**
113/24 • Sheet material **[2020.01]**
113/26 • Composites **[2020.01]**
113/28 • Fuselage, exterior or interior **[2020.01]**

Indexing scheme associated with group G06F 30/00, relating to the type of the circuit [2020.01]

115/00 Details relating to the type of the circuit [2020.01]

115/02 • System on chip [SoC] design **[2020.01]**
115/04 • Micro electro-mechanical systems [MEMS] **[2020.01]**
115/06 • Structured ASICs **[2020.01]**
115/08 • Intellectual property [IP] blocks or IP cores **[2020.01]**
115/10 • Processors **[2020.01]**
115/12 • Printed circuit boards [PCB] or multi-chip modules [MCM] **[2020.01]**

Indexing scheme associated with group G06F 30/00, relating to the type or aim of the circuit design [2020.01]

117/00 Details relating to the type or aim of the circuit design [2020.01]

117/02 • Fault tolerance, e.g. for transient fault suppression **[2020.01]**
117/04 • Clock gating **[2020.01]**
117/06 • Spare resources, e.g. for permanent fault suppression **[2020.01]**
117/08 • HW-SW co-design, e.g. HW-SW partitioning **[2020.01]**
117/10 • Buffer insertion **[2020.01]**
117/12 • Sizing, e.g. of transistors or gates **[2020.01]**

Indexing scheme associated with group G06F 30/00, relating to the purpose – mostly applicable to circuits – but also relevant for general CAD [2020.01]

119/00 Details relating to the type or aim of the analysis or the optimisation [2020.01]

119/02 • Reliability analysis or reliability optimisation; Failure analysis, e.g. worst case scenario performance, failure mode and effects analysis [FMEA] **[2020.01]**
119/04 • Ageing analysis or optimisation against ageing **[2020.01]**
119/06 • Power analysis or power optimisation **[2020.01]**
119/08 • Thermal analysis or thermal optimisation **[2020.01]**
119/10 • Noise analysis or noise optimisation **[2020.01]**
119/12 • Timing analysis or timing optimisation **[2020.01]**
119/14 • Force analysis or force optimisation, e.g. static or dynamic forces **[2020.01]**
119/16 • Equivalence checking **[2020.01]**
119/18 • Manufacturability analysis or optimisation for manufacturability **[2020.01]**
119/20 • Design reuse, reusability analysis or reusability optimisation **[2020.01]**
119/22 • Yield analysis or yield optimisation **[2020.01]**

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

1/00 Hand-manipulated computing devices (planimeters G01B 5/26) **[1, 2006.01]**
1/02 • Devices in which computing is effected by adding, subtracting, or comparing lengths of parallel or concentric graduated scales **[1, 2006.01]**
1/04 • • characterised by construction (G06G 1/10 takes precedence) **[1, 2006.01]**
1/06 • • • with rectilinear scales, e.g. slide rule **[1, 2006.01]**
1/08 • • • with circular or helical scales **[1, 2006.01]**
1/10 • • characterised by the graduation **[1, 2006.01]**
1/12 • • • logarithmic graduations, e.g. for multiplication **[1, 2006.01]**
1/14 • in which a straight or curved line has to be drawn from given points on one or more input scales to one or more points on a result scale **[1, 2006.01]**
1/16 • in which a straight or curved line has to be drawn through related points on one or more families of curves **[1, 2006.01]**

3/00 Devices in which the computing operation is performed mechanically (G06G 1/00 takes precedence) **[1, 2006.01]**
3/02 • for performing additions or subtractions, e.g. differential gearing **[1, 2006.01]**
3/04 • for performing multiplications or divisions, e.g. variable-ratio gearing **[1, 2006.01]**
3/06 • for evaluating functions by using cams and cam followers **[1, 2006.01]**
3/08 • for integrating or differentiating, e.g. by wheel and disc **[1, 2006.01]**
3/10 • for simulating specific processes, systems, or devices **[1, 2006.01]**

5/00 Devices in which the computing operation is performed by means of fluid-pressure elements (such elements in general F15C) **[1, 2006.01]**

7/00 Devices in which the computing operation is performed by varying electric or magnetic quantities (neural networks for image data processing G06T; speech analysis or synthesis G10L) **[1, 2006.01]**
7/02 • Details not covered by groups G06G 7/04-G06G 7/10 **[1, 2006.01]**
7/04 • Input or output devices (graph readers G06K 11/00; using function plotters, co-ordinate plotters G06K 15/22) **[1, 2006.01]**
7/06 • Programming arrangements, e.g. plugboard for interconnecting functional units of the computer; Digital programming **[1, 2006.01]**
7/10 • Power supply arrangements **[1, 2006.01]**
7/12 • Arrangements for performing computing operations, e.g. amplifiers specially adapted therefor (amplifiers in general H03F) **[1, 2006.01]**
7/122 • • for optimisation, e.g. least square fitting, linear programming, critical path analysis, gradient method **[2, 2006.01]**
7/14 • • for addition or subtraction (of vector quantities G06G 7/22) **[1, 2006.01]**
7/16 • • for multiplication or division **[1, 2006.01]**
7/161 • • • with pulse modulation, e.g. modulation of amplitude, width, frequency, phase, or form **[2, 2006.01]**

7/162 • • • using galvano-magnetic effects, e.g. Hall effect; using similar magnetic effects **[2, 2006.01]**

7/163 • • • using a variable impedance controlled by one of the input signals, variable amplification or transfer function **[2, 2006.01]**

7/164 • • • using means for evaluating powers, e.g. quarter square multiplier (evaluating powers G06G 7/20) **[3, 2006.01]**

7/18 • • for integration or differentiation (G06G 7/19 takes precedence) **[1, 3, 2006.01]**

7/182 • • • using magnetic elements **[3, 2006.01]**

7/184 • • • using capacitive elements **[3, 2006.01]**

7/186 • • • • using an operational amplifier comprising a capacitor or a resistor in the feedback loop **[3, 2006.01]**

7/188 • • • using electromechanical elements **[3, 2006.01]**

7/19 • • for forming integrals of products, e.g. Fourier integrals, Laplace integrals, correlation integrals; for analysis or synthesis of functions using orthogonal functions (Fourier or spectrum analysis G01R 23/16) **[1, 3, 2006.01]**

7/195 • • • using electro-acoustic elements **[3, 2006.01]**

7/20 • • for evaluating powers, roots, polynomes, mean square values, standard deviation (G06G 7/122, G06G 7/28 take precedence; gamma correction in television systems H04N 5/202, H04N 9/69) **[1, 3, 2006.01]**

7/22 • • for evaluating trigonometric functions; for conversion of co-ordinates; for computations involving vector quantities (trigonometric computations using simultaneous equations G06G 7/34) **[1, 2006.01]**

7/24 • • for evaluating logarithmic or exponential functions, e.g. hyperbolic functions **[1, 2006.01]**

7/25 • • for discontinuous functions, e.g. backlash, dead zone, limiting, absolute value, or peak value **[2, 2006.01]**

7/26 • • Arbitrary function generators (using orthogonal functions, e.g. Fourier series, G06G 7/19; using curve follower G06K 11/02) **[1, 2006.01]**

7/28 • • • for synthesising functions by piecewise approximation **[1, 2006.01]**

7/30 • • for interpolation or extrapolation (G06G 7/122 takes precedence) **[1, 2, 2006.01]**

7/32 • • for solving of equations **[1, 2006.01]**

7/34 • • • of simultaneous equations (G06G 7/122 takes precedence) **[1, 2, 2006.01]**

7/36 • • • of single equations of quadratic or higher degree (G06G 7/22, G06G 7/24 take precedence) **[1, 2006.01]**

7/38 • • • of differential or integral equations **[1, 2006.01]**

7/40 • • • • of partial differential equations (simulating specific devices G06G 7/48) **[1, 2006.01]**

7/42 • • • • • using electrolytic tank **[1, 2006.01]**

7/44 • • • • • using continuous medium, current-sensitive paper **[1, 2006.01]**

7/46 • • • • • using discontinuous medium, e.g. resistance network **[1, 2006.01]**

7/48 • Analogue computers for specific processes, systems, or devices, e.g. simulators **[1, 2, 2006.01]**

7/50 • • for distribution networks, e.g. for fluids (G06G 7/62 takes precedence) **[1, 2006.01]**

7/52 • • for economic systems; for statistics (G06G 7/122, G06G 7/19, G06G 7/20 take precedence) **[1, 3, 2006.01]**

7/54 • • for nuclear physics, e.g. nuclear reactors, radioactive fallout **[1, 2006.01]**

7/56 • • for heat flow (G06G 7/58 takes precedence) **[1, 2006.01]**

7/57 • • for fluid flow (G06G 7/50 takes precedence) **[1, 2006.01]**

7/58 • • for chemical processes (G06G 7/75 takes precedence) **[1, 2006.01]**

7/60 • • for living beings, e.g. their nervous systems **[1, 2006.01]**

7/62 • • for electric systems or apparatus **[1, 2006.01]**

7/625 • • • for impedance networks, e.g. determining response, determining poles or zeros, determining the Nyquist diagram (measuring impedance G01R 27/00) **[2, 2006.01]**

7/63 • • • for power apparatus, e.g. motors, or supply distribution networks **[2, 2006.01]**

7/635 • • • • for determining the most economical distribution in power systems **[2, 2006.01]**

7/64 • • for non-electric machines, e.g. turbine **[1, 2006.01]**

7/66 • • for control systems **[1, 2006.01]**

7/68 • • for civil-engineering structures, e.g. beam, strut, girder **[1, 2006.01]**

7/70 • • for vehicles, e.g. to determine permissible loading of ships **[1, 2006.01]**

7/72 • • • Flight simulators (Link trainers G09B 9/08) **[1, 2006.01]**

7/75 • • for component analysis, e.g. of mixtures, of colours (G06G 7/122 takes precedence) **[2, 2006.01]**

7/76 • • for traffic **[1, 2006.01]**

7/78 • • for direction-finding, locating, distance or velocity measuring, or navigation systems **[1, 2006.01]**

7/80 • • for gun-laying; for bomb aiming; for guiding missiles **[1, 2, 2006.01]**

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

G06J HYBRID COMPUTING ARRANGEMENTS (optical hybrid computing devices G06E 3/00; computer systems based on specific computational models G06N; neural networks for image data processing G06T; analogue/digital conversion, in general H03M 1/00)

Note(s)

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

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

1/00 Hybrid computing arrangements (digitally-programmed analogue computers G06G 7/06) **[1, 2006.01]**

1/02 • Differential analysers **[1, 2006.01]**

3/00 Systems for conjoint operation of complete digital and complete analogue computers [1, 2006.01]

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

Note(s)

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

Subclass index

1/00 Methods or arrangements for marking the record carrier in digital fashion [1, 2006.01]

1/02 • by punching **[1, 2006.01]**

1/04 • • controlled by sensing markings on the record carrier being punched **[1, 2006.01]**

1/05 • • High-speed punches, e.g. controlled by electric computer **[1, 2006.01]**

1/06 • • Manually-controlled devices **[1, 2006.01]**

1/08 • • • Card punches **[1, 2006.01]**

1/10 • • • Tape punches **[1, 2006.01]**

1/12 • otherwise than by punching **[1, 2006.01]**

1/14 • by transferring data from a similar or dissimilar record carrier **[1, 2006.01]**

1/16 • • by reproducing data from one punched card on to one or more punched cards without the code representation, i.e. duplicating **[1, 2006.01]**

1/18 • • by transferring data from one type of record carrier on to another type of record carrier, e.g. from magnetic tape to punched card **[1, 2006.01]**

1/20 • Simultaneous marking of record carrier and printing-out of data, e.g. printing-punch **[1, 2006.01]**

1/22 • • Simultaneous marking and printing on different record carriers, e.g. on different types of record carrier **[1, 2006.01]**

3/00 Methods or arrangements for printing of data in the shape of alphanumeric or other characters from a record carrier, e.g. interpreting, printing-out from a magnetic tape [1, 2006.01]

3/02 • Translating markings on a record carrier into printed data on the same record carrier, i.e. interpreting **[1, 2006.01]**

5/00 Methods or arrangements for verifying the correctness of markings on a record carrier; Column-detection devices [1, 2006.01]

5/02 • the verifying forming a part of the marking action **[1, 2006.01]**

5/04 • Verifying the alignment of markings **[1, 2006.01]**

7/00 Methods or arrangements for sensing record carriers (G06K 9/00 takes precedence; methods or arrangements for marking the record carrier in digital fashion G06K 1/00) **[1, 2006.01]**

7/01 • Details **[1, 2006.01]**

7/015 • • Aligning or centring of the sensing device with respect to the record carrier **[1, 2006.01]**

7/016 • • Synchronisation of sensing process **[1, 2006.01]**

7/02 • by pneumatic or hydraulic means, e.g. sensing punched holes with compressed air; by sonic means **[1, 2006.01]**

7/04 • by mechanical means, e.g. by pins operating electric contacts **[1, 2006.01]**

7/06 • by means which conduct current when a mark is sensed or absent, e.g. contact brush for a conductive mark **[1, 2006.01]**

7/08 • by means detecting the change of an electrostatic or magnetic field, e.g. by detecting change of capacitance between electrodes **[1, 2006.01]**

7/10 • by electromagnetic radiation, e.g. optical sensing; by corpuscular radiation **[1, 2006.01]**

7/12 • • using a selected wavelength, e.g. to sense red marks and ignore blue marks **[1, 2006.01]**

7/14 • • using light without selection of wavelength, e.g. sensing reflected white light **[1, 2006.01]**

9/00 Methods or arrangements for reading or recognising printed or written characters or for recognising patterns, e.g. fingerprints (methods or arrangements for graph-reading or for converting the pattern of mechanical parameters, e.g. force or presence, into electrical signals G06K 11/00; speech recognition G10L 15/00) **[1, 7, 2006.01]**

9/03 • Detection or correction of errors, e.g. by rescanning the pattern **[3, 2006.01]**

9/18 • using printed characters having additional code marks or containing code marks, e.g. the character being composed of individual strokes of different shape, each representing a different code value **[1, 2006.01]**

9/20 • Image acquisition **[3, 2006.01]**
9/22 • • using hand-held instruments **[3, 2006.01]**
9/24 • • • Construction of the instrument **[3, 2006.01]**
9/26 • • using a slot moved over the image **[3, 2006.01]**
9/28 • • using discrete sensing elements at predetermined points **[3, 2006.01]**
9/30 • • using automatic curve following means **[3, 2006.01]**
9/32 • • Aligning or centering of the image pick-up or image-field **[3, 2006.01]**
9/34 • • Segmentation of touching or overlapping patterns in the image field **[3, 2006.01]**
9/36 • Image preprocessing, i.e. processing the image information without deciding about the identity of the image **[3, 2006.01]**

Note(s) [3]

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

9/38 • • Quantising the analogue image signal **[3, 2006.01]**
9/40 • • Noise filtering **[3, 2006.01]**
9/42 • • Normalisation of the pattern dimensions **[3, 2006.01]**
9/44 • • Smoothing or thinning of the pattern **[3, 2006.01]**
9/46 • • Extraction of features or characteristics of the image **[3, 2006.01]**
9/48 • • • by coding the contour of the pattern **[3, 2006.01]**
9/50 • • • by analysing segments intersecting the pattern **[3, 2006.01]**
9/52 • • • by deriving mathematical or geometrical properties from the whole image **[3, 2006.01]**
9/54 • • Combinations of preprocessing functions **[3, 2006.01]**
9/56 • • • using a local operator, i.e. means to operate on an elementary image point in terms of the immediate surroundings of this point **[3, 2006.01]**
9/58 • • using optical means **[3, 2006.01]**
9/60 • Combination of image acquisition and preprocessing functions **[3, 2006.01]**
9/62 • Methods or arrangements for recognition using electronic means **[3, 2006.01]**
9/64 • • using simultaneous comparisons or correlations of the image signals with a plurality of references, e.g. resistor matrix **[3, 2006.01]**
9/66 • • • references adjustable by an adaptive method, e.g. learning **[3, 2006.01]**
9/68 • • using sequential comparisons of the image signals with a plurality of reference, e.g. addressable memory **[3, 2006.01]**
9/70 • • • the selection of the next reference depending on the result of the preceding comparison **[3, 2006.01]**
9/72 • • using context analysis based on the provisionally recognised identity of a number of successive patterns, e.g. a word **[3, 2006.01]**
9/74 • Arrangements for recognition using optical reference masks **[3, 2006.01]**
9/76 • • using holographic masks **[3, 2006.01]**
9/78 • Combination of image acquisition and recognition functions **[3, 2006.01]**
9/80 • Combination of image preprocessing and recognition functions **[3, 2006.01]**
9/82 • • using optical means in one or both functions **[3, 2006.01]**

11/00 Methods or arrangements for graph-reading or for converting the pattern of mechanical parameters, e.g. force or presence, into electrical signals (combined with character or pattern recognition G06K 9/00) **[1, 2, 2006.01]**

11/02 • Automatic curve followers **[1, 2006.01]**
11/04 • • using an auxiliary scanning pattern **[2, 2006.01]**
11/06 • Devices for converting the position of a manually-operated writing or tracing member into an electrical signal **[3, 2006.01]**

13/00 Conveying record carriers from one station to another, e.g. from stack to punching mechanism (conveying record carriers combined with another operation, e.g. with reading G06K 17/00) **[1, 2006.01]**

13/02 • the record carrier having longitudinal dimension comparable with transverse dimension, e.g. punched card **[1, 2006.01]**
13/04 • • Details, e.g. flaps in card-sorting apparatus **[1, 2006.01]**
13/05 • • • Capstans; Pinch rollers **[1, 2006.01]**
13/06 • • Guiding cards; Checking correct operation of card-conveying mechanisms **[1, 2, 2006.01]**
13/063 • • • Aligning cards **[2, 2006.01]**
13/067 • • • Checking presence, absence, correct position, or moving status of cards **[2, 2006.01]**
13/07 • • Transporting of cards between stations **[1, 2006.01]**
13/073 • • • with continuous movement **[2, 2006.01]**
13/077 • • • with intermittent movement; Braking or stopping movement **[2, 2006.01]**
13/08 • • Feeding or discharging cards **[1, 2006.01]**
13/10 • • • from magazine to conveying arrangement **[1, 2006.01]**
13/103 • • • • using mechanical means **[2, 2006.01]**
13/107 • • • • using pneumatic means **[2, 2006.01]**
13/12 • • • from conveying arrangement to magazine **[1, 2006.01]**
13/14 • • • Card magazines, e.g. pocket, hopper **[1, 2006.01]**
13/16 • • Handling flexible sheets, e.g. cheques **[1, 2006.01]**
13/18 • the record carrier being longitudinally extended, e.g. punched tape **[1, 2006.01]**
13/20 • • Details **[1, 2006.01]**
13/22 • • • Capstans; Pinch rollers **[1, 2006.01]**
13/24 • • Guiding of record carriers; Recognising end of record carrier **[1, 2006.01]**
13/26 • • Winding-up or unwinding of record carriers; Driving of record carriers **[1, 2, 2006.01]**
13/28 • • • continuously **[2, 2006.01]**
13/30 • • • intermittently **[2, 2006.01]**

15/00 Arrangements for producing a permanent visual presentation of the output data (printing or plotting combined with another operation, e.g. with conveying, G06K 17/00) **[1, 3, 2006.01]**

15/02 • using printers **[1, 2006.01]**
15/04 • • by rack-type printers **[1, 2006.01]**
15/06 • • by type-wheel printers **[1, 2006.01]**
15/07 • • • by continuously-rotating-type-wheel printers, e.g. rotating-type-drum printers **[2, 2006.01]**
15/08 • • by flight printing with type font moving in the direction of the printed line, e.g. chain printers **[1, 2006.01]**
15/10 • • by matrix printers **[1, 2006.01]**
15/12 • • by photographic printing **[1, 2006.01]**

15/14 • • by electrographic printing, e.g. xerography; by magnetographic printing **[1, 2006.01]**

15/16 • • Means for paper feeding or form feeding **[1, 2006.01]**

15/22 • using plotters **[1, 3, 2006.01]**

17/00 Methods or arrangements for effecting co-operative working between equipments covered by two or more of main groups G06K 1/00-G06K 15/00, e.g. automatic card files incorporating conveying and reading operations [1, 2006.01]

19/00 Record carriers for use with machines and with at least a part designed to carry digital markings [1, 2006.01]

19/02 • characterised by the selection of materials, e.g. to avoid wear during transport through the machine **[1, 2006.01]**

19/04 • characterised by the shape **[1, 2006.01]**

19/06 • characterised by the kind of the digital marking, e.g. shape, nature, code **[1, 2006.01]**

19/063 • • the carrier being marginally punched or notched, e.g. having elongated slots **[5, 2006.01]**

19/067 • • Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards (using a coded card to authorise calls from a telephone set H04M 1/675) **[5, 2006.01]**

19/07 • • • with integrated circuit chips **[5, 2006.01]**

19/073 • • • • Special arrangements for circuits, e.g. for protecting identification code in memory (protection against unauthorised use of computer memory G06F 12/14) **[5, 2006.01]**

19/077 • • • • Constructional details, e.g. mounting of circuits in the carrier **[5, 2006.01]**

19/08 • • using markings of different kinds in the same record carrier, e.g. one marking being sensed by optical and the other by magnetic means **[1, 2006.01]**

19/10 • • • at least one kind of marking being used for authentication, e.g. of credit or identity cards (verification of coded identity or credit cards in mechanisms actuated by them G07F 7/12) **[5, 2006.01]**

19/12 • • • • the marking being sensed by magnetic means **[5, 2006.01]**

19/14 • • • • the marking being sensed by radiation **[5, 2006.01]**

19/16 • • • • • the marking being a hologram or diffraction grating **[5, 2006.01]**

19/18 • • • • Constructional details **[5, 2006.01]**

21/00 Information retrieval from punched cards designed for manual use or handling by machine (G06K 19/00 takes precedence; detection or correction of errors by rescanning patterns G06K 9/03; checking correct operation of card-conveying mechanisms G06K 13/06)**; Apparatus for handling such cards, e.g. marking or correcting [1, 2006.01]**

21/02 • in which coincidence of markings is sensed mechanically, e.g. by needle **[1, 2006.01]**

21/04 • in which coincidence of markings is sensed optically, e.g. peek-a-boo system **[1, 2006.01]**

21/06 • Apparatus or tools adapted for slotting or otherwise marking information-retrieval cards **[1, 2006.01]**

21/08 • Apparatus or tools for correcting punching or slotting errors **[2, 2006.01]**

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

Note(s)

This subclass covers:

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

1/00 Design features of general application [1, 2006.01]

1/02 • Housing (for measuring instruments in general G01D) **[1, 2006.01]**

1/04 • for driving the stage of lowest order (with variable ratio of drive G06M 1/38) **[1, 2006.01]**

1/06 • • producing continuous revolution of the stage, e.g. with gear train **[1, 2006.01]**

1/08 • for actuating the drive **[1, 2006.01]**

1/10 • • by electric or magnetic means **[1, 2006.01]**

1/12 • • by fluid means **[1, 2006.01]**

1/14 • for transferring a condition from one stage to a higher stage (with variable ratio of transfer G06M 1/38) **[1, 2006.01]**

1/16 • • self-operating, e.g. by Geneva mechanism **[1, 2006.01]**

1/18 • • requiring external operation, e.g. by electromagnetic force **[1, 2006.01]**

1/20 • • specially adapted for denominations with unequal numbers in each stage, e.g. degrees and minutes of angle **[1, 2006.01]**

1/22 • for visual indication of the result of count on counting mechanisms, e.g. by window with magnifying lens **[1, 2006.01]**

1/24 • • Drums; Dials; Pointers **[1, 2006.01]**

1/26 • • Aligning means **[1, 2006.01]**

1/27 • for representing the result of count in the form of electric signals, e.g. by sensing markings on the counter drum **[1, 2006.01]**

1/272 • • using photoelectric means **[1, 2006.01]**

1/274 • • using magnetic means; using Hall-effect devices **[1, 2006.01]**

1/276 • • using mechanically-actuated contacts **[1, 2006.01]**

1/28 • for zeroising or setting to a particular value **[1, 2006.01]**

1/30 • • using heart-shaped or similar cams; using levers **[1, 2006.01]**

1/32 • • • Actuating means, e.g. magnet, spring, weight **[1, 2006.01]**

1/34 • • using reset shafts **[1, 2006.01]**

1/36 • • • Actuating means, e.g. magnet, spring, weight **[1, 2006.01]**

1/38 • for varying ratio of drive or transfer mechanism, e.g. by using alternative counting trains **[1, 2006.01]**

3/00 Counters with additional facilities (generating electric pulses at random intervals H03K 3/84) **[1, 2006.01]**

3/02 • for performing an operation at a predetermined value of the count, e.g. arresting a machine **[1, 2006.01]**

3/04 • • with an additional counter train operating in the reverse direction **[1, 2006.01]**

3/06 • for printing or separately displaying result of count (display systems G09) **[1, 2006.01]**

3/08 • for counting the input from several sources; for counting inputs of different amounts **[1, 2006.01]**

3/10 • for counting denominations with unequal numbers in each stage, e.g. degrees and minutes of angle (transfer mechanism therefor G06M 1/20) **[1, 2006.01]**

3/12 • for preventing incorrect actuation, e.g. for preventing falsification **[1, 2006.01]**

3/14 • for registering difference of positive and negative actuations **[1, 2006.01]**

Counting of objects

7/00 Counting of objects carried by a conveyor [1, 2006.01]

7/02 • wherein objects ahead of the sensing element are separated to produce a distinct gap between successive objects **[1, 2006.01]**

7/04 • • Counting of piece goods, e.g. of boxes **[1, 2006.01]**

7/06 • • Counting of flat articles, e.g. of sheets of paper **[1, 2006.01]**

7/08 • wherein the direction of movement of the objects is changed at the station where they are sensed **[1, 2006.01]**

7/10 • • Counting of flat overlapped articles, e.g. of cards **[1, 2006.01]**

9/00 Counting of objects in a stack thereof [1, 2006.01]

9/02 • by using a rotating separator incorporating pneumatic suction nozzles **[1, 2006.01]**

11/00 Counting of objects distributed at random, e.g. on a surface [1, 2006.01]

11/02 • using an electron beam scanning a surface line by line, e.g. of blood cells on a substrate **[1, 2006.01]**

11/04 • • with provision for distinguishing between different sizes of objects (investigating particle size in general G01N 15/00) **[1, 2006.01]**

15/00 Counting of objects, not otherwise provided for [2011.01]

G06N COMPUTER SYSTEMS BASED ON SPECIFIC COMPUTATIONAL MODELS [7]

3/00 Computer systems based on biological models [7, 2006.01]

3/02 • using neural network models **[7, 2006.01]**

3/04 • • Architecture, e.g. interconnection topology **[7, 2006.01]**

3/06 • • Physical realisation, i.e. hardware implementation of neural networks, neurons or parts of neurons **[7, 2006.01]**

3/063 • • • using electronic means **[7, 2006.01]**

3/067 • • • using optical means **[7, 2006.01]**

3/08 • • Learning methods **[7, 2006.01]**

3/10 • • Simulation on general purpose computers **[7, 2006.01]**

3/12 • using genetic models **[7, 2006.01]**

5/00 Computer systems using knowledge-based models [7, 2006.01]

5/02 • Knowledge representation **[7, 2006.01]**

5/04 • Inference methods or devices **[7, 2006.01]**

7/00 Computer systems based on specific mathematical models [7, 2006.01]

7/02 • using fuzzy logic (computer systems based on biological models G06N 3/00; computer systems using knowledge-based models G06N 5/00) **[7, 2006.01]**

7/04 • • Physical realisation **[7, 2006.01]**

7/06 • • Simulation on general purpose computers **[7, 2006.01]**

7/08 • using chaos models or non-linear system models **[7, 2006.01]**

10/00 Quantum computers, i.e. computer systems based on quantum-mechanical phenomena [2019.01]

20/00 Machine learning [2019.01]

20/10 • using kernel methods, e.g. support vector machines [SVM] **[2019.01]**

20/20 • Ensemble learning **[2019.01]**

99/00 Subject matter not provided for in other groups of this subclass [2010.01, 2019.01]

G06Q DATA PROCESSING SYSTEMS OR METHODS, SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING PURPOSES; SYSTEMS OR METHODS SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING PURPOSES, NOT OTHERWISE PROVIDED FOR [2006.01]

Note(s) [2006.01]

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 90/00covers systems or methods that do not involve significant data processing, when both of the following conditions are fulfilled:
   - the systems or methods are specially adapted for the purposes mentioned in the subclass title or the titles of groups G06Q 10/00-G06Q 50/00; and
   - the systems or methods cannot be classified elsewhere in the IPC, for example by applying the principles described in paragraph 96 of the Guide.

   When classifying such systems or methods in group G06Q 90/00, additional classification may be made in the most closely related group of this or any other subclass, if this classification gives information about the application of the systems or methods that could be of interest for search. Such non-obligatory classification must be given as "additional information".
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, in the absence of an indication to the contrary, classification is made in the first appropriate place.

10/00 Administration; Management [2006.01, 2012.01]

10/02 • Reservations, e.g. for tickets, services or events **[2012.01]**

10/04 • Forecasting or optimisation, e.g. linear programming, "travelling salesman problem" or "cutting stock problem" **[2012.01]**

10/06 • Resources, workflows, human or project management, e.g. organising, planning, scheduling or allocating time, human or machine resources; Enterprise planning; Organisational models **[2012.01]**

10/08 • Logistics, e.g. warehousing, loading, distribution or shipping; Inventory or stock management, e.g. order filling, procurement or balancing against orders **[2012.01]**

10/10 • Office automation, e.g. computer aided management of electronic mail or groupware (electronic mail network systems H04L 12/58; electronic mail protocols H04L 29/06); Time management, e.g. calendars, reminders, meetings or time accounting **[2012.01]**

20/00 Payment architectures, schemes or protocols (apparatus for performing or posting payment transactions G07F 7/08, G07F 19/00; electronic cash registers G07G 1/12) **[2006.01, 2012.01]**

Note(s) [2006.01]

This group covers:
- protocols or schemes which include procedures whereby a payment is made between a merchant, a bank, a user and sometimes a third party; the procedure usually includes verification and authentication of all parties involved.

20/02 • involving a neutral third party, e.g. certification authority, notary or trusted third party [TTP] **[2012.01]**

20/04 • Payment circuits **[2012.01]**

20/06 • • Private payment circuits, e.g. involving electronic currency used only among participants of a common payment scheme **[2012.01]**

20/08 • Payment architectures **[2012.01]**

20/10 • • specially adapted for electronic funds transfer [EFT] systems; specially adapted for home banking systems **[2012.01]**

20/12 • • specially adapted for electronic shopping systems **[2012.01]**

20/14 • • specially adapted for billing systems **[2012.01]**

20/16 • • Payments settled via telecommunication systems **[2012.01]**

20/18 • • involving self-service terminals [SSTs], vending machines, kiosks or multimedia terminals **[2012.01]**

20/20 • • Point-of-sale [POS] network systems **[2012.01]**

20/22 • Payment schemes or models **[2012.01]**

20/24 • • Credit schemes, i.e. "pay after" **[2012.01]**

20/26 • • Debit schemes, i.e. "pay now" **[2012.01]**

20/28 • • Pre-payment schemes, i.e. "pay before" **[2012.01]**

20/30 • characterised by the use of specific devices **[2012.01]**

20/32 • • using wireless devices **[2012.01]**

20/34 • • using cards, e.g. integrated circuit [IC] cards or magnetic cards **[2012.01]**

20/36 • • using electronic wallets or electronic money safes **[2012.01]**

20/38 • Payment protocols; Details thereof **[2012.01]**

20/40 • • Authorisation, e.g. identification of payer or payee, verification of customer or shop credentials; Review and approval of payers, e.g. check of credit lines or negative lists **[2012.01]**

20/42 • • Confirmation, e.g. check or permission by the legal debtor of payment **[2012.01]**

30/00 Commerce, e.g. shopping or e-commerce [2006.01, 2012.01]

30/02 • Marketing, e.g. market research and analysis, surveying, promotions, advertising, buyer profiling, customer management or rewards; Price estimation or determination **[2012.01]**

30/04 • Billing or invoicing **[2012.01]**

30/06 • Buying, selling or leasing transactions **[2012.01]**

30/08 • • Auctions **[2012.01]**

40/00 Finance; Insurance; Tax strategies; Processing of corporate or income taxes [2006.01, 2012.01]

40/02 • Banking, e.g. interest calculation, credit approval, mortgages, home banking or on-line banking **[2012.01]**

40/04 • Exchange, e.g. stocks, commodities, derivatives or currency exchange **[2012.01]**

40/06 • Investment, e.g. financial instruments, portfolio management or fund management **[2012.01]**

40/08 • Insurance, e.g. risk analysis or pensions **[2012.01]**

50/00 Systems or methods specially adapted for specific business sectors, e.g. utilities or tourism (healthcare informatics G16H) **[2006.01, 2012.01]**

50/02 • Agriculture; Fishing; Mining **[2012.01]**

50/04 • Manufacturing **[2012.01]**

50/06 • Electricity, gas or water supply **[2012.01]**

50/08 • Construction **[2012.01]**

50/10 • Services **[2012.01]**

50/12 • • Hotels or restaurants **[2012.01]**

50/14 • • Travel agencies **[2012.01]**

50/16 • • Real estate **[2012.01]**

50/18 • • Legal services; Handling legal documents **[2012.01]**

50/20 • • Education **[2012.01]**

50/22 • • Social work **[2012.01, 2018.01]**

50/26 • • Government or public services **[2012.01]**

50/28 • Logistics, e.g. warehousing, loading, distribution or shipping **[2012.01]**

50/30 • Transportation; Communications **[2012.01]**

50/32 • • Post and telecommunications (franking apparatus G07B 17/00) **[2012.01]**

50/34 • Betting or bookmaking, e.g. Internet betting **[2012.01]**

90/00 Systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes, not involving significant data processing [2006.01]

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

G06T IMAGE DATA PROCESSING OR GENERATION, IN GENERAL [6, 2006.01]

Subclass index

1/00 General purpose image data processing [6, 2006.01]

1/20 • Processor architectures; Processor configuration, e.g. pipelining **[6, 2006.01]**

1/40 • • Neural networks **[6, 2006.01]**

1/60 • Memory management **[6, 2006.01]**

3/00 Geometric image transformation in the plane of the image [6, 2006.01]

3/20 • Linear translation of a whole image or part thereof, e.g. panning **[6, 2006.01]**

3/40 • Scaling of a whole image or part thereof **[6, 2006.01]**

3/60 • Rotation of a whole image or part thereof **[6, 2006.01]**

5/00 Image enhancement or restoration [6, 2006.01]

5/10 • by non-spatial domain filtering **[6, 2006.01]**

5/20 • by the use of local operators **[6, 2006.01]**

5/30 • • Erosion or dilatation, e.g. thinning **[6, 2006.01]**

5/40 • by the use of histogram techniques **[6, 2006.01]**

5/50 • by the use of more than one image, e.g. averaging, subtraction **[6, 2006.01]**

7/00 Image analysis [6, 2006.01, 2017.01]

7/10 • Segmentation; Edge detection (motion-based segmentation G06T 7/215) **[2017.01]**

Note(s) [2017.01]

When classifying in groups G06T 7/11-G06T 7/13, classification is also made in relevant groups of G06T 7/136-G06T 7/194.

7/11 • • Region-based segmentation **[2017.01]**

7/12 • • Edge-based segmentation **[2017.01]**

7/13 • • Edge detection **[2017.01]**

7/136 • • involving thresholding **[2017.01]**

7/143 • • involving probabilistic approaches, e.g. Markov random field [MRF] modelling **[2017.01]**

7/149 • • involving deformable models, e.g. active contour models **[2017.01]**

7/155 • • involving morphological operators **[2017.01]**

7/162 • • involving graph-based methods **[2017.01]**

7/168 • • involving transform domain methods **[2017.01]**

7/174 • • involving the use of two or more images **[2017.01]**

7/181 • • involving edge growing; involving edge linking **[2017.01]**

7/187 • • involving region growing; involving region merging; involving connected component labelling **[2017.01]**

7/194 • • involving foreground-background segmentation **[2017.01]**

7/20 • Analysis of motion (motion estimation for coding, decoding, compressing or decompressing digital video signals H04N 19/43, H04N 19/51) **[6, 2006.01, 2017.01]**

7/207 • • for motion estimation over a hierarchy of resolutions (multi-resolution motion estimation or hierarchical motion estimation for coding, decoding, compressing or decompressing digital video signals H04N 19/53) **[2017.01]**
7/215 • • Motion-based segmentation **[2017.01]**
7/223 • • using block-matching **[2017.01]**
7/231 • • • using full search **[2017.01]**
7/238 • • • using non-full search, e.g. three-step search **[2017.01]**
7/246 • • using feature-based methods, e.g. the tracking of corners or segments **[2017.01]**
7/254 • • involving subtraction of images **[2017.01]**
7/262 • • using transform domain methods, e.g. Fourier domain methods **[2017.01]**
7/269 • • using gradient-based methods **[2017.01]**
7/277 • • involving stochastic approaches, e.g. using Kalman filters **[2017.01]**
7/285 • • using a sequence of stereo image pairs **[2017.01]**
7/292 • • Multi-camera tracking **[2017.01]**
7/30 • Determination of transform parameters for the alignment of images, i.e. image registration **[2017.01]**
7/32 • • using correlation-based methods **[2017.01]**
7/33 • • using feature-based methods **[2017.01]**
7/35 • • using statistical methods **[2017.01]**
7/37 • • using transform domain methods **[2017.01]**
7/38 • • Registration of image sequences **[2017.01]**
7/40 • Analysis of texture (depth or shape recovery from texture G06T 7/529) **[6, 2006.01, 2017.01]**
7/41 • • based on statistical description of texture **[2017.01]**
7/42 • • • using transform domain methods **[2017.01]**
7/44 • • • using image operators, e.g. filters, edge density metrics or local histograms **[2017.01]**
7/45 • • • using co-occurrence matrix computation **[2017.01]**
7/46 • • • using random fields **[2017.01]**
7/48 • • • using fractals **[2017.01]**
7/49 • • based on structural texture description, e.g. using primitives or placement rules **[2017.01]**
7/50 • Depth or shape recovery **[2017.01]**
7/507 • • from shading (G06T 7/586 takes precedence) **[2017.01]**
7/514 • • from specularities **[2017.01]**
7/521 • • from laser ranging, e.g. using interferometry; from the projection of structured light **[2017.01]**
7/529 • • from texture **[2017.01]**
7/536 • • from perspective effects, e.g. by using vanishing points **[2017.01]**
7/543 • • from line drawings **[2017.01]**
7/55 • • from multiple images **[2017.01]**
7/557 • • • from light fields, e.g. from plenoptic cameras **[2017.01]**
7/564 • • • from contours **[2017.01]**
7/571 • • • from focus **[2017.01]**
7/579 • • • from motion **[2017.01]**
7/586 • • • from multiple light sources, e.g. photometric stereo **[2017.01]**
7/593 • • • from stereo images **[2017.01]**
7/60 • Analysis of geometric attributes **[6, 2006.01, 2017.01]**
7/62 • • of area, perimeter, diameter or volume **[2017.01]**
7/64 • • of convexity or concavity **[2017.01]**
7/66 • • of image moments or centre of gravity **[2017.01]**
7/68 • • of symmetry **[2017.01]**
7/70 • Determining position or orientation of objects or cameras (camera calibration G06T 7/80) **[2017.01]**
7/73 • • using feature-based methods **[2017.01]**
7/77 • • using statistical methods **[2017.01]**
7/80 • Analysis of captured images to determine intrinsic or extrinsic camera parameters, i.e. camera calibration **[2017.01]**
7/90 • Determination of colour characteristics **[2017.01]**

9/00 **Image coding** (bandwidth or redundancy reduction for static pictures H04N 1/41; coding or decoding of static colour picture signals H04N 1/64; methods or arrangements for coding, decoding, compressing or decompressing digital video signals H04N 19/00) **[6, 2006.01]**
9/20 • Contour coding, e.g. using detection of edges **[6, 2006.01]**
9/40 • Tree coding, e.g. quadtree, octree **[6, 2006.01]**

11/00 **2D [Two Dimensional] image generation [6, 2006.01]**
11/20 • Drawing from basic elements, e.g. lines or circles **[6, 2006.01]**
11/40 • Filling a planar surface by adding surface attributes, e.g. colour or texture **[6, 2006.01]**
11/60 • Editing figures and text; Combining figures or text **[6, 2006.01]**
11/80 • Creating or modifying a manually drawn or painted image using a manual input device, e.g. mouse, light pen, direction keys on keyboard **[6, 2006.01]**

13/00 **Animation [6, 2006.01, 2011.01]**
13/20 • 3D [Three Dimensional] animation **[2011.01]**
13/40 • • of characters, e.g. humans, animals or virtual beings **[2011.01]**
13/60 • • of natural phenomena, e.g. rain, snow, water or plants **[2011.01]**
13/80 • 2D animation, e.g. using sprites **[2011.01]**

15/00 **3D [Three Dimensional] image rendering [6, 2006.01, 2011.01]**
15/02 • Non-photorealistic rendering **[2011.01]**
15/04 • Texture mapping **[2011.01]**
15/06 • Ray-tracing **[2011.01]**
15/08 • Volume rendering **[2011.01]**
15/10 • Geometric effects **[6, 2006.01, 2011.01]**
15/20 • • Perspective computation **[6, 2006.01, 2011.01]**
15/30 • • Clipping **[6, 2006.01, 2011.01]**
15/40 • • Hidden part removal **[6, 2006.01, 2011.01]**
15/50 • Lighting effects **[6, 2006.01, 2011.01]**
15/55 • • Radiosity **[2011.01]**
15/60 • • Shadow generation **[6, 2006.01]**
15/80 • • Shading **[2011.01]**
15/83 • • • Phong shading **[2011.01]**
15/87 • • • Gouraud shading **[2011.01]**

17/00 **3D modelling for computer graphics [6, 2006.01]**
17/05 • Geographic models **[2011.01]**
17/10 • Volume description, e.g. cylinders, cubes or using CSG [Constructive Solid Geometry] **[6, 2006.01]**
17/20 • Wire-frame description, e.g. polygonalisation or tessellation **[6, 2006.01]**
17/30 • Surface description, e.g. polynomial surface description **[6, 2006.01]**

19/00 **Manipulating 3D models or images for computer graphics [2011.01]**

19/20 • Editing of 3D images, e.g. changing shapes or colours, aligning objects or positioning parts **[2011.01]**