G06 COMPUTING; CALCULATING; COUNTING (score computers for games A63B 71/06, A63D 15/20, A63F 1/18; combinations of writing implements with computing devices B43K 29/08)

Notes

(1) This class covers:
- simulators which are concerned with the mathematics of computing the existing or anticipated conditions within the real device or system;
- simulators which demonstrate, by means involving computing, the function of apparatus or of a system, if no provision exists elsewhere;
- image data processing or generation.

(2) This class does not cover:
- control functions derived from simulators, in general, which are covered by class G05, although such functions may be covered by the subclass of this class for the device controlled;
- measurement or analysis of an individual variable to serve as an input to a simulator, which is covered by class G01;
- simulators regarded as teaching or training devices which is the case if they give perceptible sensations having a likeness to the sensations a student would experience in reality in response to actions taken by him. Such simulators are covered by class G09;
- components of simulators, if identical with real devices or machines, which are covered by the relevant subclass for these devices or machines (and not by class G09).

(3) In this class, the following terms or expressions are used with the meanings indicated:
- "data" is used as the synonym of "information". Therefore, the term "information" is not used in subclasses G06C, G06F or G06Q;
- "calculating or computing" includes, inter alia, operations on numerical values and on data expressed in numerical form. Of these terms "computing" is used throughout the class;
- "computation" is derived from this interpretation of "computing". In the French language the term "calcul" will serve for either term;
- "simulator" is a device which may use the same time scale as the real device or operate on an expanded or compressed time scale. In interpreting this term models of real devices to reduced or expanded scales are not regarded as simulators;
- "record carrier" means a body, such as a cylinder, disc, card, tape, or wire, capable of permanently holding information, which can be read-off by a sensing element movable relative to the recorded information.

(4) Attention is drawn to the Notes following the title of section G, especially as regards the definition of the term "variable".

G06C DIGITAL COMPUTERS IN WHICH ALL THE COMPUTATION IS EFFECTED MECHANICALLY (score computers for card games A63F 1/18; 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

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

Subclass Index

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

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

5/00 Non-functional elements

5/02 . Housings; Frameworks

7/00 Input mechanisms (pin carriage G06C 13/02)

7/02 . Keyboards

7/04 . . Interlocking devices, e.g. between keys (interlocking devices covered by this subclass, in general G06C 25/00)

7/06 . . with one set of keys for each denomination

7/08 . . with one set of keys for all denominations, e.g. ten-key board

7/09 . Transfer of data from record carrier to computing mechanisms (sensing record carriers G06K 7/00)

7/10 . Transfer mechanisms, e.g. transfer of a figure from a ten-key keyboard into the pin carriage

7/12 . Resetting devices, e.g. for the keyboard

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)

9/02 . Back-transfer arrangements, e.g. to transfer a value accumulated in a register back into the selection mechanism

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

11/02 . with visual indication, e.g. counter drum

11/04 . with printing mechanisms, e.g. for character-at-a-time or line-at-a-time printing

11/06 . . having type hammers

11/08 . with punching mechanism

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

11/12 . . for feeding tape

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

13/02 . Operand stores, e.g. pin carriage (input mechanisms G06C 7/00)

13/04 . Print buffer stores

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)

15/02 . operating on the binary scale

Note

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

15/04 . Adding or subtracting devices (G06C 15/08 takes precedence)

15/06 . . having balance totalising; Obtaining sub-total

15/08 . Multiplying or dividing devices; Devices for computing the exponent or root

15/10 . . having more than one denominational set of keys operating directly on computing mechanism

15/12 . . having pin carriage

15/14 . . having pin wheel, e.g. Odhner type

15/16 . . having stepped-toothed actuating drums, e.g. Thomas type

15/18 . . having multiplication table for forming partial products

15/20 . . adapted for short-cut multiplication or division **[2]**

15/22 . Arrangements for two or more computing devices; Arrangements for subdivision into two or more computing mechanisms, e.g. splitting

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

15/26 . Devices for transfer between orders, e.g. tens-transfer device

15/28 . . where transfer is effected in one step

15/30 . . where transfer is effected in two steps

15/32 . . . with provision for simultaneous transfer between all orders

15/34 . . where transfer is effected by planet gear, i.e. crawl type

15/36 . . . with aligning means

15/38 . . for pin-wheel computing mechanisms

15/40 . . for stepped-toothed-drum computing mechanism

15/42 . Devices for resetting to zero or other datum

15/44 . Devices for comparing numerical values, e.g. zero check

15/46 . Arrangements for rounding-off

15/48 . Arrangements for selection of one out of several counting registers (arrangements for controlling subsequent operating functions G06C 21/04; item counters G06C 25/02)

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

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

19/02 . Devices for indicating the point

19/04 . Devices for printing the point

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

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

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

23/00 Driving mechanisms for functional elements

Note

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

23/02 . of main shaft

23/04 . of pin carriage, e.g. for step-by-step movement

23/06 . of tabulation devices, e.g. of carriage skip

23/08 . Hydraulic or pneumatic actuation

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

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

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

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

G06D DIGITAL FLUID-PRESSURE COMPUTING DEVICES

Note

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

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

1/02 . having at least one moving part, e.g. spool valve

1/04 . . Adding; Subtracting

1/06 . . Multiplying; Dividing

1/08 . having no moving parts

1/10 . . Adding; Subtracting

1/12 . . Multiplying; Dividing

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

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

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

G06E OPTICAL COMPUTING DEVICES (optical logic elements per se G02F 3/00; computer systems based on specific computational models G06N; digital storage using optical elements G11C 13/04) **[5]**

Notes

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

(2) If other aspects, for example mechanical, fluid pressure or electrical computing, are of interest, classification is also made in the relevant subclass for such aspects. **[5]**

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

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

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

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

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

G06F ELECTRIC DIGITAL DATA PROCESSING (computers in which a part of the computation is effected hydraulically or pneumatically G06D, optically G06E; computer systems based on specific computational models G06N; impedance networks using digital techniques H03H)

Note

In this subclass, the following terms or expressions are used with the meaning indicated:
– "handling" includes processing or transporting of data;
– "data processing equipment" means an association of an electric digital data processor classifiable under group G06F 7/00, with one or more arrangements classifiable under groups G06F 1/00 to G06F 5/00 and G06F 9/00 to G06F 13/00.

Subclass Index

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

1/02 . Digital function generators

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

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

Note

In order to be classified in this group, the table must contain function values of the desired or an intermediate function, not merely coefficients. **[5]**

1/035 . . . Reduction of table size **[5]**

1/04 . Generating or distributing clock signals or signals derived directly therefrom

1/06 . . Clock generators producing several clock signals **[5]**

1/08 . . Clock generators with changeable or programmable clock frequency **[5]**

1/10 . . Distribution of clock signals **[5]**

1/12 . . Synchronisation of different clock signals **[5]**

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

1/16 . Constructional details or arrangements (instrument details G12B) **[5]**

1/18 . . Packaging or power distribution **[5]**

1/20 . . Cooling means **[5]**

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

1/24 . Resetting means (micro-programme loading G06F 9/24; restoration from data faults G06F 11/00) **[5]**

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

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

1/30 . . Means for acting in the event of power-supply failure or interruption, e.g. power-supply fluctuations (for resetting only G06F 1/24; involving the processing of data-words G06F 11/00) **[5]**

1/32 . . Means for saving power **[5]**

3/00 **Input arrangements for transferring data to be processed into a form capable of being handled by the computer**; **Output arrangements for transferring data from processing unit to output unit, e.g. interface arrangements** (typewriters B41J; conversion of physical variables F15B 5/00, G01; image acquisition G06T 1/00, G06T 9/00; coding, decoding or code conversion, in general H03M; transmission of digital information H04L) **[4]**

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

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

3/023 . . . Arrangements for converting discrete items of information into a coded form, e.g. arrangements for interpreting keyboard generated codes as alphanumeric codes, operand codes or instruction codes (coding in connection with keyboards or like devices in general H03M 11/00) **[3,8]**

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

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

Note

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

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

3/037 . . . . 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 **[3,8]**

3/038 . . . . Control and interface arrangements therefor, e.g. drivers or device-embedded control circuitry **[8]**

3/039 . . . . Accessories therefor, e.g. mouse pads (furniture aspects A47B 21/00) **[8]**

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

3/042 . . . . by opto-electronic means **[8]**

3/043 . . . . using propagating acoustic waves **[8]**

3/044 . . . . by capacitive means **[8]**

3/045 . . . . using resistive elements, e.g. a single continuous surface or two parallel surfaces put in contact **[8]**

3/046 . . . . by electromagnetic means **[8]**

3/047 . . . . using sets of wires, e.g. crossed wires **[8]**

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

3/05 . Digital input using the sampling of an analogue quantity at regular intervals of time (sample-and-hold arrangements G11C 27/02; sampling per se H03K 17/00; analogue/digital conversion, in general H03M 1/00)

3/06 . Digital input from, or digital output to, record carriers

3/08 . . from or to individual record carriers, e.g. punched card

3/09 . Digital output to typewriters **[3]**

3/12 . Digital output to print unit (digital output to typewriter G06F 3/09; arrangements for producing a permanent visual presentation of the output data using printers G06K 15/02)

3/13 . Digital output to plotter (arrangements for producing a permanent visual presentation of the output data using plotters G06K 15/22) **[3]**

3/14 . Digital output to display device (arrangements for producing a permanent visual presentation of the output data G06K 15/00; control of display in general G09G)

3/147 . . using display panels **[3]**

3/153 . . using cathode-ray tubes **[3]**

3/16 . Sound input; Sound output (conversion of speech into digital information or vice versa G10L)

3/18 . Digital input from automatic curve follower (automatic curve followers per se G06K 11/02) **[3]**

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

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

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

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 **[8]**

5/10 . . having a sequence of storage locations each being individually accessible for both enqueue and dequeue operations, e.g. using random access memory **[8]**

5/12 . . . Means for monitoring the fill level; Means for resolving contention, i.e. conflicts between simultaneous enqueue and dequeue operations **[8]**

5/14 . . . . for overflow or underflow handling, e.g. full or empty flags **[8]**

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 **[8]**

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

7/02 . Comparing digital values (G06F 7/06, G06F 7/38 take precedence; information retrieval G06F 17/30; comparing pulses H03K 5/22)

7/04 . . Identity comparison, i.e. for like or unlike values

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

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

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

7/12 . . . with provision for printing-out a list of selected items

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

7/16 . . . Combined merging and sorting

7/20 . . Comparing separate sets of record carriers arranged in the same sequence to determine whether at least some of the data in one set is identical with that in the other set or sets

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

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

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

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

7/36 . . Combined merging and sorting

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

7/40 . . using contact-making devices, e.g. electromagnetic relay (G06F 7/46 takes precedence)

7/42 . . . Adding; Subtracting

7/44 . . . Multiplying; Dividing

7/46 . . using electromechanical counter-type accumulators

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

7/483 . . . Computations with numbers represented by a non-linear combination of denominational numbers, e.g. rational numbers, logarithmic number system, floating-point numbers (conversion to or from floating-point codes H03M 7/24) **[8]**

7/485 . . . . Adding; Subtracting **[8]**

7/487 . . . . Multiplying; Dividing **[8]**

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

7/491 . . . Computations with decimal numbers **[8]**

7/492 . . . . using a binary weighted representation within each denomination **[8]**

7/493 . . . . . the representation being the natural binary coded representation, i.e. 8421-code **[8]**

7/494 . . . . . Adding; Subtracting **[8]**

7/495 . . . . . in digit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other **[8]**

7/496 . . . . . Multiplying; Dividing **[8]**

7/498 . . . . using counter-type accumulators **[8]**

7/499 . . . Denomination or exception handling, e.g. rounding, overflow **[8]**

7/50 . . . Adding; Subtracting (G06F 7/483 to G06F 7/491, G06F 7/544 to G06F 7/556 take precedence) **[3,8]**

7/501 . . . . Half or full adders, i.e. basic adder cells for one denomination (EXCLUSIVE-OR circuits H03K 19/21) **[8]**

7/502 . . . . . Half adders; Full adders consisting of two cascaded half adders **[8]**

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 **[8]**

7/504 . . . . in bit-serial fashion, i.e. having a single digit-handling circuit treating all denominations after each other **[8]**

7/505 . . . . in bit-parallel fashion, i.e. having a different digit-handling circuit for each denomination (half or full adders G06F 7/501) **[8]**

7/506 . . . . . with simultaneous carry generation for, or propagation over, two or more stages **[8]**

7/507 . . . . . using selection between two conditionally calculated carry or sum values **[8]**

7/508 . . . . . using carry look-ahead circuits **[8]**
7/509 . . . . . for multiple operands, e.g. digital integrators **[8]**
7/52 . . . Multiplying; Dividing (G06F 7/483 to G06F 7/491, G06F 7/544 to G06F 7/556 take precedence) **[3,8]**
7/523 . . . . Multiplying only **[8]**
7/525 . . . . . in serial-serial fashion, i.e. both operands being entered serially (G06F 7/533 takes precedence) **[8]**
7/527 . . . . . in serial-parallel fashion, i.e. one operand being entered serially and the other in parallel (G06F 7/533 takes precedence) **[8]**
7/53 . . . . . in parallel-parallel fashion, i.e. both operands being entered in parallel (G06F 7/533 takes precedence) **[8]**
7/533 . . . . . Reduction of the number of iteration steps or stages, e.g. using the Booth algorithm, log-sum, odd-even **[8]**
7/535 . . . . Dividing only **[8]**
7/537 . . . . . Reduction of the number of iteration steps or stages, e.g. using the Sweeny-Robertson-Tocher (SRT) algorithm **[8]**
7/544 . . . for evaluating functions by calculation (with a look-up table G06F 1/02) **[3]**
7/548 . . . . Trigonometric functions; Co-ordinate transformations **[3]**
7/552 . . . . Powers or roots **[3]**
7/556 . . . . Logarithmic or exponential functions **[3]**
7/57 . . . Arithmetic logic units (ALU), i.e. arrangements or devices for performing two or more of the operations covered by groups G06F 7/483 to G06F 7/556 or for performing logical operations (instruction execution G06F 9/30) **[8]**
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 **[8]**
7/58 . Random or pseudo-random number generators **[3]**
7/60 . Methods or arrangements for performing computations using a digital non-denominational number representation, i.e. number representation without radix; Computing devices using combinations of denominational and non-denominational quantity representations **[3]**
7/62 . . Performing operations exclusively by counting total number of pulses **[3]**
7/64 . . Digital differential analysers, i.e. computing devices for differentiation, integration or solving differential or integral equations, using pulses representing increments; Other incremental computing devices for solving difference equations (G06F 7/70 takes precedence; differential analysers using hybrid computing techniques G06J 1/02) **[3]**
7/66 . . . wherein pulses represent unitary increments only **[3]**
7/68 . . using pulse rate multipliers or dividers (G06F 7/70 takes precedence) **[3]**
7/70 . . using stochastic pulse trains, i.e. randomly occurring pulses the average pulse rates of which represent numbers **[3]**
7/72 . . using residue arithmetic **[3]**
7/74 . Selecting or encoding within a word the position of one or more bits having a specified value, e.g. most or least significant one or zero detection, priority encoders **[8]**
7/76 . Arrangements for rearranging, permuting or selecting data according to predetermined rules, independently of the content of the data (according to the content of the data G06F 7/06, G06F 7/22; parallel/series conversion or vice versa H03M 9/00) **[8]**
7/78 . . for changing the order of data flow, e.g. matrix transposition, LIFO buffers; Overflow or underflow handling therefor **[8]**

9/00 Arrangements for programme control, e.g. control unit (programme control for peripheral devices G06F 13/10) **[4]**
9/02 . using wired connections, e.g. plugboard
9/04 . using record carriers containing only programme instructions (G06F 9/06 takes precedence)
9/06 . using stored programme, i.e. using internal store of processing equipment to receive and retain programme
9/22 . . Micro-control or micro-programme arrangements **[3]**
9/24 . . . Loading of the micro-programme **[3]**
9/26 . . . Address formation of the next micro-instruction (G06F 9/28 takes precedence) **[3]**
9/28 . . . Enhancement of operational speed, e.g. by using several micro-control devices operating in parallel **[3]**
9/30 . . Arrangements for executing machine- instructions, e.g. instruction decode (for executing micro-instructions G06F 9/22; for executing subprogrammes G06F 9/40) **[3]**
9/302 . . . Controlling the executing of arithmetic operations **[5]**
9/305 . . . Controlling the executing of logical operations **[5]**
9/308 . . . Controlling single bit operations (G06F 9/305 takes precedence) **[5]**
9/312 . . . Controlling loading, storing or clearing operations **[5]**
9/315 . . . Controlling moving, shifting or rotation operations **[5]**
9/318 . . . with operation extension or modification **[5]**
9/32 . . . Address formation of the next instruction, e.g. incrementing the instruction counter, jump (G06F 9/38 takes precedence; subprogramme jump G06F 9/42) **[3]**
9/34 . . . Addressing or accessing the instruction operand or the result (address translation G06F 12/00) **[3,5]**
9/345 . . . . of multiple operands or results **[5]**
9/35 . . . . Indirect addressing **[5]**
9/355 . . . . Indexed addressing **[5]**
9/38 . . . Concurrent instruction execution, e.g. pipeline, look ahead **[3]**
9/40 . . Arrangements for executing subprogrammes, i.e. combinations of several instructions **[3]**
9/42 . . . Formation of subprogramme-jump address or of return address **[3]**
9/44 . . Arrangements for executing specific programmes **[3]**
9/445 . . . Programme loading or initiating **[5]**
9/45 . . . Compilation or interpretation of high level programme languages **[5]**
9/455 . . . Emulation; Software simulation **[5]**

9/46 . . Multiprogramming arrangements **[3]**
9/48 . . . Programme initiating; Programme switching, e.g. by interrupt **[7]**
9/50 . . . Allocation of resources, e.g. of the central processing unit (CPU) **[7]**
9/52 . . . Programme synchronisation; Mutual exclusion, e.g. by means of semaphores **[7]**
9/54 . . . Interprogramme communication **[7]**

11/00 **Error detection**; **Error correction**; **Monitoring** (methods or arrangements for verifying the correctness of marking on a record carrier G06K 5/00; in information storage based on relative movement between record carrier and transducer G11B, e.g. G11B 20/18; in static stores G11C 29/00; coding, decoding or code conversion, for error detection or error correction, in general H03M 13/00) **[4]**
11/07 . Responding to the occurrence of a fault, e.g. fault tolerance **[7]**
11/08 . . Error detection or correction by redundancy in data representation, e.g. by using checking codes
11/10 . . . Adding special bits or symbols to the coded information, e.g. parity check, casting out nines or elevens
11/14 . . Error detection or correction of the data by redundancy in operation, e.g. by using different operation sequences leading to the same result (G06F 11/16 takes precedence) **[3]**
11/16 . . Error detection or correction of the data by redundancy in hardware **[3]**
11/18 . . . using passive fault-masking of the redundant circuits, e.g. by quadding or by majority decision circuits **[3]**
11/20 . . . using active fault-masking, e.g. by switching out faulty elements or by switching in spare elements **[3]**
11/22 . Detection or location of defective computer hardware by testing during standby operation or during idle time, e.g. start-up testing (testing of digital circuits, e.g. of separate computer components, G01R 31/317) **[3]**
11/24 . . Marginal testing **[3]**
11/25 . . Testing of logic operation, e.g. by logic analysers **[6]**
11/26 . . Functional testing **[3]**
11/263 . . . Generation of test inputs, e.g. test vectors, patterns or sequences **[6]**
11/267 . . . Reconfiguring circuits for testing, e.g. LSSD, partitioning **[6]**
11/27 . . . Built-in tests **[6]**
11/273 . . . Tester hardware, i.e. output processing circuits **[6]**
11/277 . . . . with comparison between actual response and known fault-free response **[6]**
11/28 . by checking the correct order of processing (G06F 11/07, G06F 11/22 take precedence; monitoring patterns of pulse trains H03K 5/19) **[3]**
11/30 . Monitoring **[3]**
11/32 . . with visual indication of the functioning of the machine **[3]**
11/34 . . Recording or statistical evaluation of computer activity, e.g. of down time, of input/output operation **[3]**
11/36 . Preventing errors by testing or debugging of software **[7]**

12/00 **Accessing, addressing or allocating within memory systems or architectures** (information storage in general G11) **[4,5]**
12/02 . Addressing or allocation; Relocation (programme address sequencing G06F 9/00; arrangements for selecting an address in a digital store G11C 8/00) **[4]**
12/04 . . Addressing variable-length words or parts of words **[4]**
12/06 . . Addressing a physical block of locations, e.g. base addressing, module addressing, address space extension, memory dedication (G06F 12/08 takes precedence) **[4]**
12/08 . . in hierarchically structured memory systems, e.g. virtual memory systems **[4]**
12/10 . . . Address translation **[4]**
12/12 . . . Replacement control **[4]**
12/14 . Protection against unauthorised use of memory **[4]**
12/16 . Protection against loss of memory contents **[4]**

13/00 **Interconnection of, or transfer of information or other signals between, memories, input/output devices or central processing units** (interface circuits for specific input/output devices G06F 3/00; multi-processor systems G06F 15/16; transmission of digital information in general H04L; selecting H04Q) **[4]**
13/10 . Programme control for peripheral devices (G06F 13/14 to G06F 13/42 take precedence) **[4]**
13/12 . . using hardware independent of the central processor, e.g. channel or peripheral processor **[4]**
13/14 . Handling requests for interconnection or transfer **[4]**
13/16 . . for access to memory bus (G06F 13/28 takes precedence) **[4]**
13/18 . . . with priority control **[4]**
13/20 . . for access to input/output bus **[4]**
13/22 . . . using successive scanning, e.g. polling (G06F 13/24 takes precedence) **[4]**
13/24 . . . using interrupt (G06F 13/32 takes precedence) **[4]**
13/26 . . . . with priority control **[4]**
13/28 . . . using burst mode transfer, e.g. direct memory access, cycle steal (G06F 13/32 takes precedence) **[4]**
13/30 . . . . with priority control **[4]**
13/32 . . . using combination of interrupt and burst mode transfer **[4]**
13/34 . . . . with priority control **[4]**
13/36 . . for access to common bus or bus system **[4]**
13/362 . . . with centralised access control **[5]**
13/364 . . . . using independent requests or grants, e.g. using separated request and grant lines **[5]**
13/366 . . . . using a centralised polling arbiter **[5]**
13/368 . . . with decentralised access control **[5]**
13/37 . . . . using a physical-position-dependent priority, e.g. daisy chain, round robin or token passing **[5]**
13/372 . . . . using a time-dependent priority, e.g. individually loaded time counters or time slot **[5]**
13/374 . . . . using a self-select method with individual priority code comparator **[5]**
13/376 . . . . using a contention resolving method, e.g. collision detection, collision avoidance **[5]**
13/378 . . . . using a parallel poll method **[5]**
13/38 . Information transfer, e.g. on bus (G06F 13/14 takes precedence) **[4]**

13/40 . . Bus structure **[4]**

13/42 . . Bus transfer protocol, e.g. handshake; Synchronisation (synchronisation in transmission of digital information in general H04L 7/00) **[4]**

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

15/02 . manually operated with input through keyboard and computation using a built-in programme, e.g. pocket calculators

15/04 . programmed simultaneously with the introduction of data to be processed, e.g. on the same record carrier

15/08 . using a plugboard for programming **[5]**

15/10 . . Tabulators **[5]**

15/12 . . . having provision for both printed and punched output **[5]**

15/14 . . Calculating-punches **[5]**

15/16 . Combinations of two or more digital computers each having at least an arithmetic unit, a programme unit and a register, e.g. for a simultaneous processing of several programmes (interface circuits for specific input/output devices G06F 3/00; multi-programming arrangements G06F 9/46; transmission of digital information in general H04L, e.g. in computer networks H04L 12/00; selecting H04Q)

15/163 . . Interprocessor communication **[6]**

15/167 . . . using a common memory, e.g. mailbox (memory protection G06F 12/14; memory access priority G06F 13/18) **[6]**

15/17 . . . using an input/output type connection, e.g. channel, I/O port **[6]**

15/173 . . . using an interconnection network, e.g. matrix, shuffle, pyramid, star, snowflake (interface switching circuits G06F 13/40) **[6]**

15/177 . . Initialisation or configuration control (configuration control for monitoring, testing or in case of failure G06F 11/00) **[6]**

15/18 . in which a programme is changed according to experience gained by the computer itself during a complete run; Learning machines (adaptive control systems G05B 13/00)

15/76 . Architectures of general purpose stored programme computers (with programme plugboard G06F 15/08; multicomputers G06F 15/16; general purpose image data processing G06T 1/00) **[5,6]**

15/78 . . comprising a single central processing unit **[5]**

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

15/82 . . data or demand driven **[5]**

17/00 **Digital computing or data processing equipment or methods, specially adapted for specific functions [6]**

17/10 . Complex mathematical operations **[6]**

17/11 . . for solving equations **[6]**

17/12 . . . Simultaneous equations **[6]**

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

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

17/15 . . Correlation function computation **[6]**

17/16 . . Matrix or vector computation **[6]**

17/17 . . Function evaluation by approximation methods, e.g. inter- or extrapolation, smoothing, least mean square method (interpolation for numerical control G05B 19/18) **[6]**

17/18 . . for evaluating statistical data **[6]**

17/20 . Handling natural language data (speech analysis or synthesis G10L) **[6]**

17/21 . . Text processing (G06F 17/27, G06F 17/28 take precedence; systems for composing machines B41B 27/00) **[6]**

17/22 . . . Manipulating or registering by use of codes, e.g. in sequence of text characters **[6]**

17/24 . . . Editing, e.g. insert/delete **[6]**

17/25 . . . Automatic justification **[6]**

17/26 . . . Automatic hyphenation **[6]**

17/27 . . Automatic analysis, e.g. parsing, orthograph correction **[6]**

17/28 . . Processing or translating of natural language (G06F 17/27 takes precedence) **[6]**

17/30 . Information retrieval; Database structures therefor **[6]**

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

17/50 . Computer-aided design (for the design of test circuits for static stores G11C 29/54) **[6,8]**

19/00 **Digital computing or data processing equipment or methods, specially adapted for specific applications** (G06F 17/00 takes precedence; data processing systems or methods specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes G06Q) **[6,8]**

Note

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

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

21/02 . by protecting specific internal components of computers **[8]**

21/04 . by protecting specific peripheral devices, e.g. keyboards or displays **[8]**

21/06 . by sensing unauthorised manipulation of, or intrusion into, an enclosure e.g. a housing or a room **[8]**

21/20 . by restricting access to nodes in a computer system or computer network **[8]**

21/22 . by restricting access to, or manipulation of, programmes or processes **[8]**

21/24 . by protecting data directly, e.g. by labelling **[8]**

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

1/00 **Hand-manipulated computing devices** (planimeters G01B 5/26)

1/02 . Devices in which computing is effected by adding, subtracting, or comparing lengths of parallel or concentric graduated scales

1/04 . . characterised by construction (G06G 1/10 takes precedence)

1/06 . . . with rectilinear scales, e.g. slide rule

1/08 . . . with circular or helical scales

1/10 . . characterised by the graduation

1/12 . . . logarithmic graduations, e.g. for multiplication

1/14 . in which a straight or curved line has to be drawn from given points on one or more input scales to one or more points on a result scale

1/16 . in which a straight or curved line has to be drawn through related points on one or more families of curves

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

3/02 . for performing additions or subtractions, e.g. differential gearing

3/04 . for performing multiplications or divisions, e.g. variable-ratio gearing

3/06 . for evaluating functions by using cams and cam followers

3/08 . for integrating or differentiating, e.g. by wheel and disc

3/10 . for simulating specific processes, systems, or devices

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

7/00 **Devices in which the computing operation is performed by varying electric or magnetic quantities** (neural networks for image data processing G06T; speech analysis or synthesis G10L)

7/02 . Details not covered by groups G06G 7/04 to G06G 7/10

7/04 . Input or output devices (graph readers G06K 11/00; using function plotters, co-ordinate plotters G06K 15/22)

7/06 . Programming arrangements, e.g. plugboard for interconnecting functional units of the computer; Digital programming

7/10 . Power supply arrangements

7/12 . Arrangements for performing computing operations, e.g. amplifiers specially adapted therefor (amplifiers in general H03F)

7/122 . . for optimisation, e.g. least square fitting, linear programming, critical path analysis, gradient method **[2]**

7/14 . . for addition or subtraction (of vector quantities G06G 7/22)

7/16 . . for multiplication or division

7/161 . . . with pulse modulation, e.g. modulation of amplitude, width, frequency, phase, or form **[2]**

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

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

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

7/18 . . for integration or differentiation (G06G 7/19 takes precedence) **[3]**

7/182 . . . using magnetic elements **[3]**

7/184 . . . using capacitive elements **[3]**

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

7/188 . . . using electromechanical elements **[3]**

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

7/195 . . . using electro-acoustic elements **[3]**

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) **[3]**

7/22 . . for evaluating trigonometric functions; for conversion of co-ordinates; for computations involving vector quantities (trigonometric computations using simultaneous equations G06G 7/34)

7/24 . . for evaluating logarithmic or exponential functions, e.g. hyperbolic functions

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

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

7/28 . . . for synthesising functions by piecewise approximation

7/30 . . for interpolation or extrapolation (G06G 7/122 takes precedence) **[2]**

7/32 . . for solving of equations

7/34 . . . of simultaneous equations (G06G 7/122 takes precedence) **[2]**

7/36 . . . of single equations of quadratic or higher degree (G06G 7/22, G06G 7/24 take precedence)

7/38 . . . of differential or integral equations

7/40 . . . . of partial differential equations (simulating specific devices G06G 7/48)

7/42 . . . . . using electrolytic tank

7/44 . . . . . using continuous medium, current-sensitive paper

7/46 . . . . . using discontinuous medium, e.g. resistance network

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

7/50 . . for distribution networks, e.g. for fluids (G06G 7/62 takes precedence)

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

7/54 . . for nuclear physics, e.g. nuclear reactors, radioactive fallout

7/56 . . for heat flow (G06G 7/58 takes precedence)
7/57 . . for fluid flow (G06G 7/50 takes precedence)
7/58 . . for chemical processes (G06G 7/75 takes precedence)
7/60 . . for living beings, e.g. their nervous systems
7/62 . . for electric systems or apparatus
7/625 . . . for impedance networks, e.g. determining response, determining poles or zeros, determining the Nyquist diagram (measuring impedance G01R 27/00) **[2]**
7/63 . . . for power apparatus, e.g. motors, or supply distribution networks **[2]**
7/635 . . . . for determining the most economical distribution in power systems **[2]**
7/64 . . for non-electric machines, e.g. turbine
7/66 . . for control systems
7/68 . . for civil-engineering structures, e.g. beam, strut, girder
7/70 . . for vehicles, e.g. to determine permissible loading of ships
7/72 . . . Flight simulators (Link trainers G09B 9/08)
7/75 . . for component analysis, e.g. of mixtures, of colours (G06G 7/122 takes precedence) **[2]**
7/76 . . for traffic
7/78 . . for direction-finding, locating, distance or velocity measuring, or navigation systems
7/80 . . for gun-laying; for bomb aiming; for guiding missiles **[2]**

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

Note

In this subclass, the following expression is used with the meaning indicated:
– "hybrid computing arrangement" is an arrangement in which part of the computation is digital and part is analogue.

1/00 **Hybrid computing arrangements** (digitally-programmed analogue computers G06G 7/06)
1/02 . Differential analysers

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

G06K **RECOGNITION OF DATA**; **PRESENTATION OF DATA**; **RECORD CARRIERS**; **HANDLING RECORD CARRIERS** (postal sorting B07C; secondary surveillance radar G01S; detecting presence of transponders or tags G01S, G01V)

Notes

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

Subclass Index

1/00 **Methods or arrangements for marking the record carrier in digital fashion** (interpreting G06K 3/02)
1/02 . by punching (punching in general B26F)
1/04 . . controlled by sensing markings on the record carrier being punched (sensing of record carriers G06K 7/00)
1/05 . . High-speed punches, e.g. controlled by electric computer
1/06 . . Manually-controlled devices
1/08 . . . Card punches
1/10 . . . Tape punches (specially adapted for a particular purpose, see the relevant subclass, e.g. for transmission of digital information H04L)
1/12 . otherwise than by punching (printing in general B41, e.g. B41J)

1/14 . by transferring data from a similar or dissimilar record carrier

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

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

1/20 . Simultaneous marking of record carrier and printing-out of data, e.g. printing-punch

1/22 . . Simultaneous marking and printing on different record carriers, e.g. on different types of record carrier

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

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

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

5/02 . the verifying forming a part of the marking action

5/04 . Verifying the alignment of markings

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

7/01 . Details

7/015 . . Aligning or centring of the sensing device with respect to the record carrier (in general G11B)

7/016 . . Synchronisation of sensing process (in general G11B)

7/02 . by pneumatic or hydraulic means, e.g. sensing punched holes with compressed air; by sonic means

7/04 . by mechanical means, e.g. by pins operating electric contacts

7/06 . by means which conduct current when a mark is sensed or absent, e.g. contact brush for a conductive mark

7/08 . by means detecting the change of an electrostatic or magnetic field, e.g. by detecting change of capacitance between electrodes

7/10 . by electromagnetic radiation, e.g. optical sensing; by corpuscular radiation

7/12 . . using a selected wavelength, e.g. to sense red marks and ignore blue marks

7/14 . . using light without selection of wavelength, e.g. sensing reflected white light

9/00 Methods or arrangements for reading or recognising printed or written characters or for recognising patterns, e.g. fingerprints (processing or analysis of tracks of nuclear particles G01T 5/02; testing patterns on paper currency or similar valuable papers G07D 7/20; speech recognition G10L 15/00) **[1,7]**

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

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

9/20 . Image acquisition **[3]**

9/22 . . using hand-held instruments **[3]**

9/24 . . . Construction of the instrument **[3]**

9/26 . . using a slot moved over the image **[3]**

9/28 . . using discrete sensing elements at predetermined points **[3]**

9/30 . . using automatic curve following means **[3]**

9/32 . . Aligning or centering of the image pick-up or image-field **[3]**

9/34 . . Segmentation of touching or overlapping patterns in the image field **[3]**

9/36 . Image preprocessing, i.e. processing the image information without deciding about the identity of the image (image data processing or generation, in general G06T) **[3]**

Note

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

9/38 . . Quantising the analogue image signal **[3]**

9/40 . . Noise filtering **[3]**

9/42 . . Normalisation of the pattern dimensions **[3]**

9/44 . . Smoothing or thinning of the pattern **[3]**

9/46 . . Extraction of features or characteristics of the image **[3]**

9/48 . . . by coding the contour of the pattern **[3]**

9/50 . . . by analysing segments intersecting the pattern **[3]**

9/52 . . . by deriving mathematical or geometrical properties from the whole image **[3]**

9/54 . . Combinations of preprocessing functions **[3]**

9/56 . . . using a local operator, i.e. means to operate on an elementary image point in terms of the immediate surroundings of this point **[3]**

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

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

9/62 . Methods or arrangements for recognition using electronic means (learning machines G06F 15/18; digital correlation G06F 17/15; analogue correlation G06G 7/19) **[3]**

9/64 . . using simultaneous comparisons or correlations of the image signals with a plurality of references, e.g. resistor matrix **[3]**

9/66 . . . references adjustable by an adaptive method, e.g. learning **[3]**

9/68 . . using sequential comparisons of the image signals with a plurality of reference, e.g. addressable memory **[3]**

9/70 . . . the selection of the next reference depending on the result of the preceding comparison **[3]**

9/72 . . using context analysis based on the provisionally recognised identity of a number of successive patterns, e.g. a word **[3]**

9/74 . Arrangements for recognition using optical reference masks (optical analogue correlation G06E 3/00) **[3]**

9/76 . . using holographic masks **[3]**

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

9/80 . Combination of image preprocessing and recognition functions **[3]**

9/82 . . using optical means in one or both functions **[3]**

11/00 **Methods or arrangements for graph-reading or for converting the pattern of mechanical parameters, e.g. force or presence, into electrical signals** (combined with character or pattern recognition G06K 9/00; feelers for copying devices on machine tools B23Q 35/00; arrangements for measuring areas G01B; measuring force G01L; adapted as input devices to computers G06F 3/00; systems for transmitting the position of an object with respect to a predetermined reference system, e.g. tele-autographic system, G08C 21/00) **[2]**

11/02 . Automatic curve followers

11/04 . . using an auxiliary scanning pattern **[2]**

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

13/00 **Conveying record carriers from one station to another, e.g. from stack to punching mechanism** (transport devices in general B65G)

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

13/04 . . Details, e.g. flaps in card-sorting apparatus

13/05 . . . Capstans; Pinch rollers

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

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

13/067 . . . Checking presence, absence, correct position, or moving status of cards **[2]**

13/07 . . Transporting of cards between stations

13/073 . . . with continuous movement **[2]**

13/077 . . . with intermittent movement; Braking or stopping movement **[2]**

13/08 . . Feeding or discharging cards

13/10 . . . from magazine to conveying arrangement

13/103 . . . . using mechanical means **[2]**

13/107 . . . . using pneumatic means **[2]**

13/12 . . . from conveying arrangement to magazine

13/14 . . . Card magazines, e.g. pocket, hopper (card magazines in general B42F)

13/16 . . Handling flexible sheets, e.g. cheques

13/18 . the record carrier being longitudinally extended, e.g. punched tape (features of interest apart from data processing G11B; magnetic-tape drive G11B 15/00)

13/20 . . Details

13/22 . . . Capstans; Pinch rollers

13/24 . . Guiding of record carriers; Recognising end of record carrier

13/26 . . Winding-up or unwinding of record carriers; Driving of record carriers **[2]**

13/28 . . . continuously **[2]**

13/30 . . . intermittently **[2]**

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

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

15/04 . . by rack-type printers

15/06 . . by type-wheel printers

15/07 . . . by continuously-rotating-type-wheel printers, e.g. rotating-type-drum printers **[2]**

15/08 . . by flight printing with type font moving in the direction of the printed line, e.g. chain printers

15/10 . . by matrix printers

15/12 . . by photographic printing

15/14 . . by electrographic printing, e.g. xerography; by magnetographic printing

15/16 . . Means for paper feeding or form feeding

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

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

19/00 **Record carriers for use with machines and with at least a part designed to carry digital markings** (record carriers adapted for controlling specific machines, see the appropriate subclass for the machine, e.g. B23Q, D03C, G10F, H04L; form printing B41; file cards B42F 19/00; record carriers in general G11)

19/02 . characterised by the selection of materials, e.g. to avoid wear during transport through the machine

19/04 . characterised by the shape

19/06 . characterised by the kind of the digital marking, e.g. shape, nature, code

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

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

19/07 . . . with integrated circuit chips **[5]**

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

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

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

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

19/12 . . . . the marking being sensed by magnetic means **[5]**

19/14 . . . . the marking being sensed by radiation **[5]**

19/16 . . . . . the marking being a hologram or diffraction grating **[5]**

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

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

21/02 . in which coincidence of markings is sensed mechanically, e.g. by needle

21/04 . in which coincidence of markings is sensed optically, e.g. peek-a-boo system

21/06 . Apparatus or tools adapted for slotting or otherwise marking information-retrieval cards (tools for perforating in general B26F)

21/08 . Apparatus or tools for correcting punching or slotting errors **[2]**

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

Note

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

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

1/02 . Housing (for measuring instruments in general G01D)

1/04 . for driving the stage of lowest order (with variable ratio of drive G06M 1/38)

1/06 . . producing continuous revolution of the stage, e.g. with gear train

1/08 . for actuating the drive

1/10 . . by electric or magnetic means

1/12 . . by fluid means

1/14 . for transferring a condition from one stage to a higher stage (with variable ratio of transfer G06M 1/38)

1/16 . . self-operating, e.g. by Geneva mechanism

1/18 . . requiring external operation, e.g. by electromagnetic force

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

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

1/24 . . Drums; Dials; Pointers

1/26 . . Aligning means

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

1/272 . . using photoelectric means

1/274 . . using magnetic means; using Hall-effect devices

1/276 . . using mechanically-actuated contacts

1/28 . for zeroising or setting to a particular value

1/30 . . using heart-shaped or similar cams; using levers

1/32 . . . Actuating means, e.g. magnet, spring, weight

1/34 . . using reset shafts

1/36 . . . Actuating means, e.g. magnet, spring, weight

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

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

3/02 . for performing an operation at a predetermined value of the count, e.g. arresting a machine

3/04 . . with an additional counter train operating in the reverse direction

3/06 . for printing or separately displaying result of count (display systems G09)

3/08 . for counting the input from several sources; for counting inputs of different amounts

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

3/12 . for preventing incorrect actuation, e.g. for preventing falsification

3/14 . for registering difference of positive and negative actuations

Counting of objects (in machines for making cigarettes A24C 5/32; in machines for shaping metal without removing material B21C 51/00; in printing machines or presses B41F 33/02; in office copying machines B41L 39/02; of axles of rail vehicles B61L 1/16; in packaging machines B65B 65/08; of objects conveyed through a pipe or tube B65G 51/36; entry or exit registers G07C 9/00)

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

7/02 . wherein objects ahead of the sensing element are separated to produce a distinct gap between successive objects

7/04 . . Counting of piece goods, e.g. of boxes

7/06 . . Counting of flat articles, e.g. of sheets of paper

7/08 . wherein the direction of movement of the objects is changed at the station where they are sensed

7/10 . . Counting of flat overlapped articles, e.g. of cards

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

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

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

11/02 . using an electron beam scanning a surface line by line, e.g. of blood cells on a substrate

11/04 . . with provision for distinguishing between different sizes of objects (investigating particle size in general G01N 15/00)

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

1/00 **Computer systems not provided for in groups G06N 3/00 to G06N 7/00 [7]**

3/00 **Computer systems based on biological models** (analogue computers simulating functional aspects of living beings G06G 7/60) **[7]**

3/02 . using neural network models (for adaptive control G05B 13/00; for image pattern matching G06K 9/00; for image data processing G06T 1/40; for phonetic pattern matching G10L 15/16) **[7]**

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

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

3/063 . . . using electronic means **[7]**

3/067 . . . using optical means **[7]**

3/08 . . Learning methods **[7]**

3/10 . . Simulation on general purpose computers **[7]**

3/12 . using genetic models **[7]**

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

5/02 . Knowledge representation **[7]**

5/04 . Inference methods or devices **[7]**

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

7/02 . using fuzzy logic (G06N 3/00, G06N 5/00 take precedence; for adaptive control G05B 13/00) **[7]**

7/04 . . Physical realisation **[7]**

7/06 . . Simulation on general purpose computers **[7]**

7/08 . using chaos models or non-linear system models **[7]**

G06Q **DATA PROCESSING SYSTEMS OR METHODS, SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING PURPOSES; SYSTEMS OR METHODS SPECIALLY ADAPTED FOR ADMINISTRATIVE, COMMERCIAL, FINANCIAL, MANAGERIAL, SUPERVISORY OR FORECASTING PURPOSES, NOT OTHERWISE PROVIDED FOR [8]**

Notes

(1) Groups G06Q 10/00 to G06Q 50/00 and G06Q 99/00 only cover systems or methods that involve significant data processing operations, i.e. data processing operations that need to be carried out by a technological, e.g. computing, system or device. **[8]**
Group G06Q 90/00 covers systems or methods that do not involve significant data processing, when both of the following conditions are fulfilled: **[8]**
- the systems or methods are specially adapted for the purposes mentioned in the subclass title or the titles of groups G06Q 10/00 to G06Q 50/00; and **[8]**
- the systems or methods cannot be classified elsewhere in the IPC, for example by applying the principles described in paragraph 96 of the Guide. **[8]**

When classifying such systems or methods in group G06Q 90/00, additional classification may be made in the most closely related group of this or any other subclass, if this classification gives information about the application of the systems or methods that could be of interest for search. Such non-obligatory classification must be given as "additional information". **[8]**

(2) When classifying in groups G06Q 10/00 to G06Q 40/00, systems or methods that are specially adapted for a specific business sector must also be classified in group G06Q 50/00, when the special adaptation is determined to be novel and non-obvious. **[8]**

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

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

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

Note

This group covers: **[8]**
- protocols or schemes which include procedures whereby a payment is made between a merchant, a bank, a user and sometimes a third party; the procedure usually includes verification and authentication of all parties involved. **[8]**

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

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

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

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

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

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

Notes

(1) This subclass covers: **[6]**
- arrangements for geometrically modelling objects, whether the final model is used for display of an image of the object or for some other purpose, such as manufacture of a corresponding object; **[6]**
- arrangements for analysing the geometric attributes of an image of an object. **[6]**

(2) This subclass does not cover: **[6]**
- photogrammetry or videogrammetry, which are covered by subclass G01C; **[8]**
- reading or recognising printed or written characters or recognising patterns, e.g. fingerprints, which is covered by subclass G06K; **[6]**
- modification of image data to allow display using multiple viewports, which is covered by subclass G09G; **[6]**
- circuits for generating functions for visual indicators, which are covered by subclass G09G; **[6]**
- scanning of documents or the like in pictorial communication, which is covered by subclass H04N. **[6]**

Subclass Index

1/00 **General purpose image data processing [6]**

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

1/40 . . Neural networks **[6]**

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

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

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

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

3/60 . Rotation of a whole image or part thereof **[6]**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

15/20 . . Perspective computation **[6]**

15/30 . . Clipping **[6]**

15/40 . . Hidden part removal **[6]**

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

15/60 . . Shadowing **[6]**

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

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

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

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

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

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

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