

## SECTION G — PHYSICS

## G06 COMPUTING; CALCULATING; COUNTING

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

- 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.
- This subclass does not cover printing per se.

Subclass index

READING	
Characters; graphs.....	9/00, 11/00
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Characters; patterns.....	9/00
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RECORD CARRIERS, PUNCHED CARDS.....	19/00, 21/00

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

- 1/02 • by punching
- 1/04 • • controlled by sensing markings on the record carrier being punched
- 1/05 • • High-speed punches, e.g. controlled by electric computer
- 1/06 • • Manually-controlled devices
- 1/08 • • • Card punches
- 1/10 • • • Tape punches
- 1/12 • otherwise than by punching
- 1/14 • by transferring data from a similar or dissimilar record carrier
- 1/16 • • by reproducing data from one punched card on to one or more punched cards without the code representation, i.e. duplicating
- 1/18 • • by transferring data from one type of record carrier on to another type of record carrier, e.g. from magnetic tape to punched card
- 1/20 • Simultaneous marking of record carrier and printing-out of data, e.g. printing-punch
- 1/22 • • Simultaneous marking and printing on different record carriers, e.g. on different types of record carrier

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

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

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

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

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

- 7/01 • Details
- 7/015 • • Aligning or centring of the sensing device with respect to the record carrier
- 7/016 • • Synchronisation of sensing process
- 7/02 • by pneumatic or hydraulic means, e.g. sensing punched holes with compressed air; by sonic means
- 7/04 • by mechanical means, e.g. by pins operating electric contacts
- 7/06 • by means which conduct current when a mark is sensed or absent, e.g. contact brush for a conductive mark
- 7/08 • by means detecting the change of an electrostatic or magnetic field, e.g. by detecting change of capacitance between electrodes
- 7/10 • by electromagnetic radiation, e.g. optical sensing; by corpuscular radiation

- 7/12 • • using a selected wavelength, e.g. to sense red marks and ignore blue marks
- 7/14 • • using light without selection of wavelength, e.g. sensing reflected white light

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

- 9/03 • Detection or correction of errors, e.g. by rescanning the pattern [3]
- 9/18 • using printed characters having additional code marks or containing code marks, e.g. the character being composed of individual strokes of different shape, each representing a different code value
- 9/20 • Image acquisition [3]
- 9/22 • • using hand-held instruments [3]
- 9/24 • • • Construction of the instrument [3]
- 9/26 • • using a slot moved over the image [3]
- 9/28 • • using discrete sensing elements at predetermined points [3]
- 9/30 • • using automatic curve following means [3]
- 9/32 • • Aligning or centering of the image pick-up or image-field [3]
- 9/34 • • Segmentation of touching or overlapping patterns in the image field [3]
- 9/36 • Image preprocessing, i.e. processing the image information without deciding about the identity of the image [3]

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

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

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

- 9/72 • • using context analysis based on the provisionally recognised identity of a number of successive patterns, e.g. a word [3]
- 9/74 • Arrangements for recognition using optical reference masks [3]
- 9/76 • • using holographic masks [3]
- 9/78 • Combination of image acquisition and recognition functions [3]
- 9/80 • Combination of image preprocessing and recognition functions [3]
- 9/82 • • using optical means in one or both functions [3]

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

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

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

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

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

- 15/02 • using printers
- 15/04 • • by rack-type printers
- 15/06 • • by type-wheel printers

- 15/07 • • • by continuously-rotating-type-wheel printers, e.g. rotating-type-drum printers [2]
- 15/08 • • by flight printing with type font moving in the direction of the printed line, e.g. chain printers
- 15/10 • • by matrix printers
- 15/12 • • by photographic printing
- 15/14 • • by electrographic printing, e.g. xerography; by magnetographic printing
- 15/16 • • Means for paper feeding or form feeding
- 15/22 • using plotters [3]
  
- 17/00 Methods or arrangements for effecting co-operative working between equipments covered by two or more of main groups G06K 1/00-G06K 15/00, e.g. automatic card files incorporating conveying and reading operations**
  
- 19/00 Record carriers for use with machines and with at least a part designed to carry digital markings**
- 19/02 • characterised by the selection of materials, e.g. to avoid wear during transport through the machine
- 19/04 • characterised by the shape
- 19/06 • characterised by the kind of the digital marking, e.g. shape, nature, code
- 19/063 • • the carrier being marginally punched or notched, e.g. having elongated slots [5]
- 19/067 • • Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards (using a coded card to authorise calls from a telephone set H04M 1/675) [5]
- 19/07 • • • with integrated circuit chips [5]
  
- 19/073 • • • • Special arrangements for circuits, e.g. for protecting identification code in memory (protection against unauthorised use of computer memory G06F 12/14) [5]
- 19/077 • • • • Constructional details, e.g. mounting of circuits in the carrier [5]
- 19/08 • • using markings of different kinds in the same record carrier, e.g. one marking being sensed by optical and the other by magnetic means
- 19/10 • • • at least one kind of marking being used for authentication, e.g. of credit or identity cards (verification of coded identity or credit cards in mechanisms actuated by them G07F 7/12) [5]
- 19/12 • • • • the marking being sensed by magnetic means [5]
- 19/14 • • • • the marking being sensed by radiation [5]
- 19/16 • • • • the marking being a hologram or diffraction grating [5]
- 19/18 • • • • Constructional details [5]
  
- 21/00 Information retrieval from punched cards designed for manual use or handling by machine**  
(G06K 19/00 takes precedence; detection or correction of errors by rescanning patterns G06K 9/03; checking correct operation of card-conveying mechanisms G06K 13/06); **Apparatus for handling such cards, e.g. marking or correcting**
- 21/02 • in which coincidence of markings is sensed mechanically, e.g. by needle
- 21/04 • in which coincidence of markings is sensed optically, e.g. peek-a-boo system
- 21/06 • Apparatus or tools adapted for slotting or otherwise marking information-retrieval cards
- 21/08 • Apparatus or tools for correcting punching or slotting errors [2]