## CPC COOPERATIVE PATENT CLASSIFICATION

### G PHYSICS
*(NOTES omitted)*

## INSTRUMENTS

### G06 COMPUTING; CALCULATING; COUNTING
*(NOTES omitted)*

### G06K RECOGNITION OF DATA; PRESENTATION OF DATA; RECORD CARRIERS; HANDLING RECORD CARRIERS

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

#### WARNING
In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

<table>
<thead>
<tr>
<th>1/00</th>
<th>Methods or arrangements for marking the record carrier in digital fashion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/02</td>
<td>by punching</td>
</tr>
<tr>
<td>1/025</td>
<td>(Details, e.g. construction of the punching mechanism)</td>
</tr>
<tr>
<td>1/04</td>
<td>controlled by sensing markings on the record carrier being punched</td>
</tr>
<tr>
<td>1/05</td>
<td>High-speed punches, e.g. controlled by electric computer</td>
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<tr>
<td>1/06</td>
<td>Manually-controlled devices</td>
</tr>
<tr>
<td>1/08</td>
<td>Card punches</td>
</tr>
<tr>
<td>1/10</td>
<td>Tape punches</td>
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<tr>
<td>1/12</td>
<td>otherwise than by punching</td>
</tr>
<tr>
<td>1/121</td>
<td>(by printing code marks (applying code marks to labels B65C 9/46; marking or coding completed packages B65B 61/26))</td>
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<tr>
<td>1/123</td>
<td>(for colour code marks)</td>
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<tr>
<td>1/125</td>
<td>(by magnetic means)</td>
</tr>
<tr>
<td>1/126</td>
<td>(by photographic or thermographic registration (recording apparatus for measuring instruments G01D 15/00))</td>
</tr>
<tr>
<td>1/128</td>
<td>(by electric registration, e.g. electrolytic, spark erosion (recording apparatus for measuring instruments G01D 15/06; information storage in general G11))</td>
</tr>
<tr>
<td>1/14</td>
<td>by transferring data from a similar or dissimilar record carrier</td>
</tr>
<tr>
<td>1/16</td>
<td>by reproducing data from one punched card on to one or more punched cards without the code representation, i.e. duplicating</td>
</tr>
<tr>
<td>1/18</td>
<td>by transferring data from one type of record carrier on to another type of record carrier, e.g. from magnetic tape to punched card</td>
</tr>
<tr>
<td>1/20</td>
<td>Simultaneous marking of record carrier and printing-out of data, e.g. printing-punch</td>
</tr>
</tbody>
</table>

| 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, {e.g. for reading patterns} *(G06K 9/00 takes precedence; methods or arrangements for marking the record carrier in digital fashion G06K 1/00)*

| 7/0004 | (Hybrid readers) |
| 7/0008 | General problems related to the reading of electronic memory record carriers, independent of its reading method, e.g. power transfer |
| 7/0013 | (by galvanic contacts, e.g. card connectors for ISO-7816 compliant smart cards or memory cards, e.g. SD card readers (connectors in general H01R 13/00; connectors for SIM cards used in mobile phones or the like H04B 1/3816)) |
| 7/0017 | (the reading head of the connector being removably attached to the housing) |
| 7/0021 | (for reading/sensing record carriers having surface contacts) |
| 7/0026 | (the galvanic contacts of the connector adapted for landing on the contacts of the card upon card insertion) |
contacts by mechanical means, e.g. by pins operating electric { ; by ultrasonic means } punched holes with compressed air; by sonic means
by pneumatic or hydraulic means, e.g. sensing
Details ( testing of electrical circuits G01R 31/28
interrogator or smart card reader functions properly
Testing the sensing arrangement, e.g. testing if 
controlling electric circuits}

Synchronisation of sensing process
respect to the record carrier
Aligning or centering of the sensing device with 
the operations of the card connector }

comprising an arrangement for steering
the connector comprising a circuit for steering
the circuit comprising an arrangement for
avoiding intrusions and unwanted access to
data inside of the connector }

Testing the sensing arrangement, e.g. testing if 
a magnetic card reader, bar code reader, RFID
interrogator or smart card reader functions properly 
(testing of electrical circuits G01R 31/28)

Details
Aligning or centering of the sensing device with 
respect to the record carrier
Synchronisation of sensing process
{ by means of additional timing marks on the 
record-carrier}
{ by means of clock-signals derived from the 
code marks, e.g. self-clocking code }
by pneumatic or hydraulic means, e.g. sensing
punched holes with compressed air; by sonic means
; by ultrasonic means }
by mechanical means, e.g. by pins operating electric
contacts
{ controlling electric circuits }
{ whereby the entire datafield of the record carriers is simultaneously sensed }

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

{ for conductive marks }
by means detecting the change of an electrostatic or magnetic field, e.g. by detecting change of capacitance between electrodes

{electrostatic, e.g. by detecting the charge of capacitance between electrodes} 
{ using inductive or magnetic sensors }

{ inductive (G06K 7/10336 takes precedence) }

{ sensing magnetic material by relative movement detecting flux changes without altering its magnetised state }
{ metal detectors }
{sensing passive circuit, e.g. resonant circuit transponders }
{ flux-sensitive, e.g. magnetic, detectors (G06K 7/10336 takes precedence) }
{ using magneto-sensitive switches, e.g. reed-switches }
{ hand-held scanners }
by electromagnetic radiation, e.g. optical sensing; 
by corpuscular radiation
{ sensing by radiation using wavelengths larger than 0.1 mm, e.g. radio-waves or microwaves }

This group covers electromagnetic interrogation as radiated by the antenna of an interrogation device while interrogating a plurality of wireless electronic memory record carriers, e.g. non-contact smart cards, RFID tags or labels, or transponders

{ the collision being resolved in the time domain, e.g. using binary tree search or RFID responses allocated to a random time slot }
{ interrogator driven, i.e. synchronous }
{ binary tree }
{ transponder driven }
{ the collision being resolved in the frequency domain, e.g. by hopping from one frequency to the other (frequency hopping or spread spectrum techniques H04B 7/00) }
{ the collision being resolved in the spatial domain, e.g. temporary shields for blindfolding the interrogator in specific directions }
{ the interrogation device using at least one directional antenna or directional interrogation field to resolve the collision (direction or location finding, such as triangulation techniques, G01S 13/00) }
programming parameters and operating modes}

7/10188 . . . . [the repeating consisting of intelligently propagating data from record carriers via intermediate stations to the interrogation device, e.g. a distant RFID or RFID falling in a “shadow” region sending its identification data to an interrogation device using at least the help of one further RFID that is positioned in a region “visible” to the interrogation device, the further RFID therefore functioning as a relay station]

7/10198 . . . . [setting parameters for the interrogator, e.g. programming parameters and operating modes]

7/10207 . . . . [parameter settings related to power consumption of the interrogator]

7/10217 . . . . [parameter settings controlling the transmission power of the interrogator]

7/10227 . . . . [loading programming parameters or programs into the interrogator, e.g. for configuring the interrogator]

7/10237 . . . . [the reader and the record carrier being capable of selectively switching between reader and record carrier appearance, e.g. in near field communication (NFC) devices where the NFC device may function as an RFID reader or as an RFID tag]

7/10247 . . . . [issues specific to the use of single wire protocol [SWP] in NFC like devices]

7/10257 . . . . [arrangements for protecting the interrogation against piracy attacks (computer security in general G06F 21/00; jamming of communication, countermeasures H04K 3/00; secret communication H04K 1/00)]

7/10267 . . . . [the arrangement comprising a circuit inside of the interrogation device]

7/10277 . . . . [the arrangement being mechanical, such as reinforced housings or protective cages against unlawful entry]

7/10287 . . . . [the arrangement including a further device in the proximity of the interrogation device, e.g. signal scrambling devices]

7/10297 . . . . [arrangements for handling protocols designed for non-contact record carriers such as RFIDs NFCs, e.g. ISO/IEC 14443 and 18092 (protocols for data communication in general, see H04L 29/06)]

7/10306 . . . . [ultra wide band]

7/10316 . . . . [using at least one antenna particularly designed for interrogating the wireless record carriers (antennas in general H01Q 1/22)]

7/10326 . . . . [the antenna being of the very-near field type, e.g. capacitive]

7/10336 . . . . [the antenna being of the near field type, inductive coil]

7/10346 . . . . [the antenna being of the far field type, e.g. HF types or dipoles]

7/10356 . . . . [using a plurality of antennas, e.g. configurations including means to resolve interference between the plurality of antennas]

7/10366 . . . . [the interrogation device being adapted for miscellaneous applications]

7/10376 . . . . [the interrogation device being adapted for being moveable]

7/10386 . . . . [the interrogation device being of the portable or hand-held type, e.g. incorporated in ubiquitous hand-held devices such as PDA or mobile phone, or in the form of a portable dedicated RFID reader]

7/10396 . . . . [the interrogation device being wearable, e.g. as a glove, bracelet, or ring (wearable aerials in general H01Q 1/27)]

7/10405 . . . . [the interrogation device including an arrangement for sensing environmental parameters, such as a temperature or acceleration sensor, e.g. used as an on/off trigger or as a warning means]
[the interrogation device being fixed in its position, such as an access control device for reading wireless access cards, or a wireless ATM (banking machines in general G07F 19/00)]

{the interrogation device being arranged for interrogation of record carriers passing by the interrogation device}

{the interrogation device being positioned close to a conveyor belt or the like on which moving record carriers are passing (conveying in accordance with bodily destination marks, see B65G 47/46, sorting of objects carrying identification markings, see B07C 5/34)}

{the record carriers being fixed to further objects, e.g. RFID's fixed to packages, luggage, mail-pieces or work-pieces transported on a conveyor belt}

{the record carriers being fixed to an endless tape or at least not fixed to further objects}

{the interrogation device being capable of self-diagnosis, e.g. in addition to or as part of the actual interrogation process (testing of electrical circuits in general G01R 31/28)}

{arrangements to facilitate interaction with further interrogation devices, e.g. such that at least two interrogation devices may function and cooperate in a network of such devices}

{Arrangement of optical elements}

{Circuits for pulse forming, amplifying}

{Data fields affixed to objects or articles}

{Randomly orientated data fields}

{Hand-held scanners}

{Scanner to be worn on a finger or on a wrist}

{by scanning of the records by radiation in the optical part of the electromagnetic spectrum}

{Moving beam scanning}

{Light sources}

{Multiple sources}

{Source control}

{Beam path}

{Basic scanning using moving elements}

{by rotation, e.g. polygon}

{Constructional details}

{by oscillation}

{Activating means}

{using flexible or piezoelectric means}

{using hologram}

{Parallel lines}

{Arrangement of fixed elements}

{for omnidirectional scanning}

{Particularities of propagating elements, e.g. lenses, mirrors (G06K 7/10831 takes precedence)}

{Fixed beam scanning}

{Photodetector array or CCD scanning}

{Light sources}

{including a diffuser for diffusing the light from the light source to create substantially uniform illumination of the target record carrier}

{Exposure time control}

{Relative movement}

{Moved readers, e.g. pen, wand}

{Slot readers}

{Special measures in relation to the object to be scanned}

{Multidistance reading}

{Focalisation}

{further details of bar or optical code scanning devices}

{Arrangement of optical elements, e.g. lenses, mirrors, prisms (optical elements per se G02B)}

{Particularities of the light-sensitive elements (semiconductor devices H01L)}

{Circuits for pulse shaping, amplifying, eliminating noise signals, checking the function of the sensing device (basic electronic circuitry H03)}

{sensing of data fields affixed to objects or articles, e.g. coded labels (postal sorting B07C 3/14, conveying articles B65G 47/48)}

{randomly oriented data-fields, code-marks therefore, e.g. concentric circles-code}

{constructional details of hand-held scanners}

{the scanner to be worn on a finger or on a wrist}

{adaptations to make the hand-held scanner useable as a fixed scanner}

{means to wake up the scanner from a sleep mode, e.g. using an acceleration sensor indicating that the scanner is being picked up by a user}

{sensing by means of TV-scanning}

{sensing, after transfer of the image of the data-field to an intermediate store, e.g. storage with cathode ray tube}

{the record carrier being at least partially of the hologram type}

{the scanner comprising adaptations for scanning a record carrier that is displayed on a display-screen or the like}

{the scanner having more than one scanning window, e.g. two substantially orthogonally placed scanning windows for integration into a check-out counter of a super-market}

{Optical sensing of electronic memory record carriers, such as interrogation of RFID's with an additional optical interface}

{the scanning arrangement having a modular construction}

{scanning using X-rays}

{using a selected wavelength, e.g. to sense red marks and ignore blue marks}

{using light without selection of wavelength, e.g. sensing reflected white light (G06K 7/10831 - G06K 7/1097 take precedence)}
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; information retrieval G06F 16/00; radio frequency identification G06K 7/00; recognition of barcodes and similar code images G06K 7/10; computer systems based on specific computational models G06N; image analysis, inspection, positioning or tracking G06T 7/00; recognition of acoustic speech signals G10L 15/00; acoustic speaker identification G10L 17/00))

NOTES
   [This Note corresponds to IPC Note (1) relating to G06K 9/38 - G06K 9/54.]
2. [In this group, the following term is used with the meaning indicated: “recognising” includes several functions such as extracting features, clustering, classifying or matching.]
3. [IPC subgroups G06K 9/20, G06K 9/36, G06K 9/62 and G06K 9/74 refer to methods or arrangements that can be applied to a pattern independently of its nature or to that are applied to specific patterns not included in the subgroups in the range G06K 9/00006 - G06K 9/00852. The CPC subgroups in the range G06K 9/00006 - G06K 9/00852 refer to the same methods or arrangements when applied or specially adapted to the specific patterns to which these subgroups relate.]
4. (The present group does not cover the use of recognised patterns in specific applications, e.g. the use of traced gestures recognised as commands to be input to a computer is covered by the groups under G06F 3/00.)

2009/0006 . . . [Acquiring or recognising fingerprints or palmprints (non-computerised biometric identification A61B 5/00; means for preventing unauthorised use of vehicles B60R 25/00; security in computer systems G06F 21/00; secure access to buildings G07C 9/00; secret or secure communication H04L 9/00; means for preventing unauthorised telephone calls H04M 1/667)]
9/00127 . . . (Acquiring and recognising microscopic objects, e.g. biological cells and cellular parts (apparatus for measuring microbiological properties C12M 1/34; optical analysis of chemical or physical properties of particles, e.g. investigation of dimensions G01N 15/14; biomedical image inspection G06T 7/0012))

9/00134 . . . (Acquisition, e.g. centering the image field (fluorescence analysis G01N 21/64; scanning microscopes G02B 21/402; processing of multiple slides G02B 21/365))

9/00134 . . . (Pre-processing, e.g. image segmentation (segmentation for general image processing G06T 7/10); Feature extraction)

9/00134 . . . (Matching; Classification)

9/00134 . . . (Reading or verifying signatures; Writer recognition)

9/00134 . . . (based only on signature image, e.g. static signature recognition)

9/00134 . . . (based only on signature signals such as velocity or pressure, e.g. dynamic signature recognition)

9/00134 . . . (Acquisition)

9/00134 . . . (Matching; classification)

9/00134 . . . (Preprocessing; feature extraction)

9/00134 . . . (Sampling; contour coding; stroke extraction)

9/00201 . . . (Recognising three-dimensional objects, e.g. using range or tactile information (arrangements for measuring depth G01B 11/22; for measuring curvatures G01B 11/24; processing image data for depth or shape recovery G06T 7/50; registration of range data G06T 7/30))

9/00208 . . . (by matching two-dimensional images to three-dimensional objects)

9/00214 . . . (by matching three-dimensional models, e.g. conformal mapping of Riemann surfaces)

9/00221 . . . (Acquiring or recognising human faces, facial parts, facial sketches, facial expressions)

9/00228 . . . (Detection; Localisation; Normalisation)

9/00234 . . . (using pixel segmentation or colour matching (segmentation for general image processing G06T 7/10; colour analysis G06T 7/90))

9/00241 . . . (using holistic features (extraction or representation of holistic features per se G06K 9/00275))

9/00248 . . . (using facial parts and geometric relationships (extraction or representation of facial parts per se G06K 9/00281))

9/00255 . . . (using acquisition arrangements)

9/00261 . . . (using comparisons between temporally consecutive images (face tracking G06T 7/20))

9/00268 . . . (Feature extraction; Face representation)

9/00275 . . . (Holistic features and representations, i.e. based on the facial image taken as a whole (statistical feature extraction in general G06K 9/6232; matching eigenfaces G06K 9/00288))

9/00281 . . . (Local features and components; Facial parts (iris recognition G06K 9/00597); Occluding parts, e.g. glasses; Geometrical relationships)

9/00288 . . . (Classification, e.g. identification)

9/00295 . . . (of unknown faces, i.e. recognising the same non-enrolled faces, e.g. recognising the unknown faces across different face tracks (tracking in general G06T 7/20; detecting affinities between people using analysis of image collections G06K 9/00677))

9/00302 . . . (Facial expression recognition)

9/00308 . . . (Static expression)

9/00315 . . . (Dynamic expression)

2009/00322 . . . (estimating age from face image; using age information for improving recognition)

2009/00328 . . . (metadata assisted face recognition)

9/00335 . . . (Recognising movements or behaviour, e.g. recognition of gestures, dynamic facial expressions; Lip-reading (using movements or postures of body parts for inputting data to a computer G06F 3/00; static facial expressions G06K 9/00221; recognition of scene events G06K 9/00624; analysis of movement G06T 7/20; lip-reading assisted speech recognition G10L 15/24))

9/00342 . . . (Recognising whole body movements, e.g. for sport training)

9/00348 . . . (Recognition of walking or running movements, e.g. gait recognition)

9/00355 . . . (Recognition of hand or arm movements, e.g. recognition of deaf sign language (static hand posture recognition G06K 9/00375))

9/00362 . . . (Recognising human body or animal bodies, e.g. vehicle occupant, pedestrian; Recognising body parts, e.g. hand (passenger detection systems B60N 2/002; fingerprints G06K 9/00006; face and facial components G06K 9/00221; eyes G06K 9/00597; determining position of passenger G06T 7/70))

9/00369 . . . (Recognisation of whole body, e.g. static pedestrian or occupant recognition (G06K 9/00342 takes precedence))

9/00375 . . . (Recognition of hand or arm, e.g. static hand biometric or posture recognition (G06K 9/00355 takes precedence; palmprint and fingerprint recognition G06K 9/00006))

9/00382 . . . (Static hand biometric or posture recognition)

9/00389 . . . (Static hand gesture recognition)

2009/00395 . . . (Biometrics derived from hands; static hand pose gestures)

9/00402 . . . (Recognising digital ink, i.e. recognising temporal sequences of handwritten position coordinates (G06K 9/00154 takes precedence; interaction arrangements using gestures traced on a digitiser G06F 3/04883; acquisition of digital ink as far as essentially related to recognition G06K 9/222))

9/00409 . . . (Preprocessing; Feature extraction)

9/00416 . . . (Sampling; contour coding; stroke extraction)

9/00422 . . . (Matching; classification)

9/00429 . . . (using a special pattern or subpattern alphabet)

9/00436 . . . (using human interaction, e.g. selection of the best displayed recognition candidate)

9/00442 . . . (Document analysis and understanding; Document recognition)

9/00449 . . . (Layout structured with printed lines or input boxes, e.g. business forms, tables (tables without printed lines or boxes G06K 9/00463; identification of document type using identifier or marker G06K 9/2054))
[Classification of image contents, e.g. text, photographs, tables (discrimination based on image tones H04N 1/40062)]

[Document analysis by extracting the geometrical structure, e.g. layout tree; Block segmentation, e.g. bounding boxes for graphics, paragraphs, words or letters]

[Document understanding by extracting the logical structure, e.g. chapters, sections, columns, titles, paragraphs, captions, page number, and identifying its elements, e.g. author, keywords, ZIP code, money amount]

[Reading or recognising technical drawings or geographical maps]

[Document matching]

[Editing text-bitmaps, e.g. alignment, spacing; Semantic analysis of bitmaps of text without OCR]

[Recognising patterns in signals and combinations thereof (signature verification G06K 9/00154; analysing specific medical signals, e.g. bioelectric signals, blood pressure A61B 5/00; processing radar and similar signals G01S; analysis of chromatographic signals G01N 30/86; processing seismic signals G01V 1/28, G01V 1/46; acoustic speech processing G10L; transmission systems H04B 1/00)]

[Preprocessing, e.g. filtering (electrical circuits for filtering H03H; adaptive filters H03H 21/00; convolution-based filters H03H 17/00, H03H 21/00)]

[Denoising]

[by applying a scale-space analysis, e.g. using wavelet analysis]

[Feature extraction (arrangements for measuring frequencies and for spectral analysis G01R 23/16; algorithms for spectral analysis, digital electric mathematical transforms per se G06F 17/14)]

[by analysing the shape of a waveform, e.g. extracting parameters relating to peaks]

[Classification; Matching (digital electric correlation G06F 17/15; electronic classification and matching per se G06K 9/62)]

[by matching peak patterns]

[by matching signal segments]

[by plotting the signal segments against each other, e.g. analysing scattergrams]

[by applying autoregressive analysis]

[Source localisation; Inverse modelling (electroencephalography A61B 5/369; source separation G06K 9/624; image reconstruction from projection, e.g. tomography G06T 11/003; beam formers in general G10K 11/34; radio transmission systems for beam forming H04B 7/04)]

[Recognising objects characterised by unique random properties, i.e. objects having a physically unclonable function [PUF], e.g. authenticating objects based on their unclonable texture (verifying genuineness of valuable papers G07D 7/00)]

[Recognition of the sensor which acquired the data, e.g. based on sensor idiosyncrasies]

[markers for authenticating, copy prevention]

[Acquiring or recognising eyes, e.g. iris verification]
sensors G08G 1/04
analysing traffic situation by means of optical
relative to traffic conditions G08G 1/0104
cameras (measuring or analysing of parameters
{Recognising traffic patterns acquired by static
circuit television systems H04N 7/18
pictorial communication H04N 5/144
and comparing systems G08B 13/194
motion analysis using general image processing
(G06K 9/00785
with Markovian modelling of scene activity
takes precedence; recognition
{ Recognising scenes under surveillance, e.g. with Markovian modelling of scene activity
(G06K 9/00785 takes precedence; recognition
of movements or behaviour G06K 9/00335;
motion analysis using general image processing
G06T 7/20; intruder alarms using image scanning
and comparing systems G06B 13/194; circuitry
for movement detection and estimation for
 pictorial communication H04N 5/144; closed
circuit television systems H04N 7/18)
{ Recognition of static or dynamic crowd
images, e.g. recognition of crowd congestion
(recognition of individual pedestrians
G06K 9/00369; recognition of whole body
movements G06K 9/00342; counting
mechanisms G06M; analysis of motion
G06T 7/20; individual entry or exit registers
G07C 9/00)
{ Recognising traffic patterns acquired by static
cameras (measuring or analysing of parameters
relative to traffic conditions G08G 1/0104;
alysing traffic situation by means of optical
sensors G08G 1/04)
9/00973 . [Hardware and software architectures for pattern recognition, e.g. modular organisation]
9/00979 . [structured as a network]
9/00986 . [using specific electronic processors]
9/00993 . [Management of recognition tasks]
9/03 . Detection or correction of errors, e.g. by resampling the pattern (validation or performance evaluation G06K 9/6261)
9/03 . [with the intervention of an operator]
9/03 . [Evaluation of quality of acquired pattern]
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
9/183 . [Characters composed of bars, e.g. CMC-7 (bar code forming unreadable characters, e.g. UPC, G06K 7/00)]
9/186 . [Recognition of characters printed with magnetic ink (G06K 9/183 takes precedence)]
9/20 . Image acquisition
9/209 . [Construction of image pick-up using regular bi-dimensional dissection]
9/2018 . [Identifying/ignoring parts by sensing at different wavelengths]
9/2027 . [Special illumination control]
9/2036 . [Special illumination such as grating, reflections, deflections, e.g. for characters with relief]
9/2045 . [using multiple overlapping images]
9/2054 . [Selective acquisition/locating/processing of specific regions, e.g. highlighted text, fiducial marks, predetermined fields, document type identification G06K 9/2054 take precedence; recognising the document type with the paragraph layout G06K 9/00442; recognising the document type with the layout of printed lines or input boxes G06K 9/00449)]
9/2063 . [based on a marking or identifier characterising the document or the area (markings for centering the field of view on the document G06K 9/3216)]
9/2072 . [based on positionally close symbols, e.g. amount sign or URL-specific characters (recognition with lexical or semantic context G06K 9/72)]
9/2081 . [based on user interaction]
9/209 . [Sensor details, e.g. position, configuration, special lenses (G06K 9/2018 takes precedence)]
9/22 . using hand-held instruments
9/222 . [the instrument generating sequences of position coordinates corresponding to handwriting; preprocessing or recognising digital ink (pen or stylus type devices inputting position G06F 3/03545, light pens G06F 3/03542; interaction arrangements using gestures traced on a digitiser G06F 3/04883)]
9/224 . [in three dimensions]
2009/226 . [by sensing position defining codes on a support]
9/228 . [Hand-held scanners; Optical wands]
9/24 . [Construction of the instrument]
9/26 . using a slot moved over the image
9/28 . using discrete sensing elements at predetermined points
9/30 . using automatic curve following means
9/32 . Aligning or centering of the image pick-up or image-field
9/3208 . [Orientation detection or correction, e.g. rotation of multiples of 90 degrees]
9/3216 . [by locating a pattern (G06K 9/3208; G06K 9/3272 take precedence; centering within a document with a marking G06K 9/2063)]
2009/3225 . [Special marks for positioning]
9/3233 . [Determination of region of interest (segmentation for general image processing G06T 7/110)]
9/3241 . [Recognising objects as potential recognition candidates based on visual cues, e.g. shape]
9/325 . [Detection of text region in scene imagery, real life image or Web pages, e.g. licenses plates, captions on TV images]
9/3258 . [Scene text, e.g. street name]
9/3266 . [Overlay text, e.g. embedded caption in TV program]
9/3275 . [Inclination (skew) detection or correction of characters or of image to be recognised (determining orientation of objects in general G06T 7/110)]
9/3283 . [of characters or characters lines]
2009/3291 . [Pattern tracking]
9/34 . Segmentation of touching or overlapping patterns in the image field (segmentation by quantisation, e.g. thresholding, G06K 9/38; edge detection for image feature extraction G06K 9/4604; extraction of connected components or edge linking G06K 9/4638; segmentation or edge detection for general image processing G06T 7/10)
9/342 . [Cutting or merging image elements, e.g. region growing, watershed, clustering-based techniques (smoothing or thinning of patterns G06K 9/44; clustering techniques G06K 9/6218; region-based segmentation for general image processing G06T 7/11)]
9/344 . [using recognition of characters or words (lexical postprocessing of segmented characters G06K 9/72)]
9/346 . [Removing patterns interfering with the pattern to be recognised, such as ruled lines, underlines (extracting table structures G06K 9/00442; document recognition G06K 9/2054)]
9/348 . [using character size, text spacings, pitch estimation]
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)
2009/363 . [Correcting image deformation, e.g. trapezoidal deformation caused by perspective]
2009/366 . [Interactive preprocessing or shape modelling, e.g. assignment of feature points by a user]
9/38 . Quantising the analogue image signal ( e.g. histogram thresholding for discrimination between background and foreground patterns (region-based segmentation of touching or overlapping patterns G06K 9/342; image segmentation for general image processing G06T 7/11)]
9/40 . Noise filtering (restoration for general image processing G06T 5/001; morphologic operations for general image enhancement G06T 5/30)
Normalisation of the pattern dimensions

Smoothing or thinning of the pattern

Extraction of features or characteristics of the image

Detecting partial patterns, e.g. edges or contours, or configurations, e.g. loops, corners, strokes, intersections (extracting features by contour coding)

Biologically-inspired filters, e.g. Gabor wavelets or local ICA kernels

Normalisation of the pattern dimensions

Graphical representation, e.g. directed attributed graph

Sparse representation

by coding the contour of the pattern

by using vector-coding

by analysing the spectrum of the contour

by using a gradient analysis

by using statistical shape modelling

by using wavelet analysis

by analysing segments intersecting the pattern

by deriving mathematical or geometrical properties from the whole image

by computing moments

by computing autocorrelation

by computing scale-space

by pre-processing functions

by using a local operator, i.e. means to operate on an elementary image point in terms of the immediate surroundings of this point

by using optical means

using specific hyperspectral computations of features
Combination of image acquisition and preprocessing functions

Methods or arrangements for recognition using electronic means (machine learning G06N 20/000; digital correlation G06F 17/15; analogue correlation G06G 7/19)

Matching; Proximity measures

Comparing pixel values or logical combinations thereof, or feature values having positional relevance, e.g. template matching (specially adapted for image alignment G06T 7/30; specially adapted for position determination G06T 7/70; specially adapted for the calculation of depth from stereo images G06T 7/50; specially adapted for image segmentation G06T 7/10; specially adapted for the analysis of motion G06T 7/20)

Shifting or otherwise transforming the patterns to accommodate for positional errors

(Matching of contours (G06K 9/6206, G06K 9/6211 take precedence))

by mapping curve parameters onto an accumulator array, e.g. generalised Hough Transform (detecting primitive shapes such as lines and circles by accumulating parameters of a known equation G06K 9/4633))

involving a deformation of the sample or reference pattern; Elastic matching (segmentation of touching or overlapping patterns involving deformable models G06K 9/34; segmentation involving deformable models for general image processing G06T 7/149)

based on a local optimisation criterion, e.g. "snakes", i.e. active contour models of the pattern to be recognised

based on shape statistics, e.g. active shape models of the pattern to be recognised

based also on statistics of image patches, e.g. active appearance models of the pattern to be recognised

Matching configurations of points or features, e.g. constellation matching (G06K 9/0087 takes precedence)

Comparing statistics of pixel or of feature values, e.g. histogram matching

(region based matching)

Based on a parametric eigenspace representation, e.g. eigenspace representation using pose or illumination parameters; Shape manifold

Proximity measures, i.e. similarity or distance measures

Design or setup of recognition systems and techniques; Extraction of features in feature space; Clustering techniques; Blind source separation (regression analysis G06F 17/18)

Clustering techniques

Hierarchical techniques, i.e. dividing or merging pattern sets so as to obtain a dendogram

Non-hierarchical partitioning techniques

based on statistics

with an adaptive number of clusters, e.g. ISODATA technique

with a fixed number of clusters, e.g. K-means clustering

based on graph theory, e.g. Minimum Spanning Trees [MST], graph cuts, spectral clustering techniques (segmentation of touching or overlapping patterns involving graph-based approaches G06K 9/342; graph embedding G06K 9/6252; segmentation involving graph-based approaches for general image processing G06T 7/162)

based on the modelling of probability density functions

Selection of pattern recognition techniques, e.g. of classifiers in a multi-classifier system

Selecting the most significant subset of features (G06K 9/6232 takes precedence)

(by using evolutionary computational techniques, e.g. genetic algorithms (genetic algorithms per se G06N 3/126))

by ranking or filtering the set of features, e.g. using a measure of variance or of feature cross-correlation

by evaluating different subsets according to an optimisation criteria such as class separability, e.g. forward selection, backward elimination (linear discriminant analysis G06K 9/6234)

Extracting features by transforming the feature space, e.g. multidimensional scaling; Mappings, e.g. subspace methods

based on a discrimination criterion, e.g. discriminant analysis (discriminant functions G06K 9/6227)

Rendering the within-class scatter matrix nonsingular

involving a first projection stage, e.g. Fisherface techniques

involving an optimisation, e.g. using regularisation techniques

involving a subspace restriction, e.g. nullspace techniques

based on a naturality criterion, e.g. with non-negative factorisation or negative correlation (matrix computation G06F 17/16)

based on a separation criterion, e.g. independent component analysis

of statistical independence, i.e. minimising mutual information or maximising nongaussianness

of decorrelation or non-stationarity, e.g. minimising lagged cross-correlations
9/6244 . . . . (enforcing sparsity or involving a domain transformation)
9/6245 . . . . (characterised by a domain transformation)
9/6246 . . . . (overcoming non-stationarity or permutations (using non-stationarity for separation G06K 9/6244))
9/6247 . . . . (based on an approximation criterion, e.g. principal component analysis)
9/6248 . . . . (nonlinearly, e.g. embedding a manifold in a Euclidean space (principal curves G06K 9/6251))
9/6249 . . . . (based on a sparsity criterion, e.g. with an overcomplete basis (specific for source separation G06K 9/6244; pictorial communication involving matching pursuit H04N 19/97))
9/6251 . . . . (based on a criterion of topology preservation, e.g. multidimensional scaling, self-organising maps)
9/6252 . . . . (involving differential geometry, e.g. embedding of pattern manifold)
9/6253 . . . . (User interactive design (G06K 9/6263 takes precedence); Environments; Tool boxes)
9/6254 . . . . (Interactive pattern learning with a human teacher)
9/6255 . . . . (determining representative reference patterns, e.g. averaging or distorting patterns; Generating dictionaries, e.g. user dictionaries)
9/6256 . . . . (Obtaining sets of training patterns; Bootstrap methods, e.g. bagging, boosting)
9/6257 . . . . (characterised by the organisation or the structure of the process, e.g. boosting cascade (feature selection by floating search G06K 9/6231))
9/6259 . . . . (characterised by the incorporation of unlabelled data, e.g. multiple instance learning [MIL], semi-supervised techniques using expectation-maximisation [EM] or naïve labelling [EM techniques G06K 9/6225; validation with "oracles" G06K 9/6263])
9/626 . . . . (Selecting classification rules)
9/6261 . . . . (partitioning the feature space)
9/6262 . . . . (Validation, performance evaluation or active pattern learning techniques)
9/6263 . . . . (based on the feedback of a supervisor (relevance feedback in information retrieval G06F 16/00))
9/6264 . . . . (the supervisor being an automated "intelligent" module, e.g. "intelligent oracle")
9/6265 . . . . (based on a specific statistical test)
9/6267 . . . . (Classification techniques)
9/6268 . . . . (relating to the classification paradigm, e.g. parametric or non-parametric approaches)
9/6269 . . . . (based on the distance between the decision surface and training patterns lying on the boundary of the class cluster, e.g. support vector machines)
9/627 . . . . (based on distances between the pattern to be recognised and training or reference patterns)
9/6271 . . . . (based on distances to prototypes)
9/6272 . . . . (based on distances to cluster centroids)
9/6273 . . . . (Smoothing the distance, e.g. Radial Basis Function Networks)
9/6274 . . . . (based on distances to neighbourhood prototypes, e.g. Restricted Coulomb Energy Networks)
9/6276 . . . . (based on distances to closest patterns, e.g. nearest neighbour classification)
9/6277 . . . . (based on a parametric (probabilistic) model, e.g. based on Neyman-Pearson lemma, likelihood ratio, Receiver Operating Characteristic [ROC] curve plotting a False Acceptance Rate [FAR] versus a False Reject Rate [FRR] (segmentation of touching or overlapping patterns involving probabilistic approaches G06K 9/34; image connectivity analysis involving probabilistic approaches, e.g. Markov Random Fields techniques, G06K 9/4638; segmentation involving probabilistic approaches for general image processing G06T 7/143))
9/6278 . . . . (Bayesian classification)
9/6279 . . . . (relating to the number of classes)
9/628 . . . . (Multiple classes)
9/6281 . . . . (Piecewise classification, i.e. whereby each classification requires several discriminant rules)
9/6282 . . . . (Tree-organised sequential classifiers)
9/6284 . . . . (Single class perspective, e.g. one-against-all classification; Novelty detection; Outlier detection)
9/6285 . . . . (relating to the decision surface)
9/6286 . . . . (Linear, e.g. hyperplane)
9/6287 . . . . (Non-linear, e.g. polynomial classifier (G06K 9/6284 takes precedence; classifier with multiple radial basis functions G06K 9/6273))
9/6288 . . . . (Fusion techniques, i.e. combining data from various sources, e.g. sensor fusion (bootstrap techniques, e.g. boosting G06K 9/6256; data unmixing G06K 9/6243; image matching G06K 9/64; fusion of acoustic speaker inputs G10L 17/10))
9/6289 . . . . (of input or preprocessed data (imaging spectrometers G01J 3/2823; image fusion in general and biomedical image fusion G06T 5/90; processing and conversion of colour signals H04N 1/46))
9/629 . . . . (of extracted features)
9/6292 . . . . (of classification results, e.g. of classification results related to same input data (G06K 9/6256 takes precedence))
9/6293 . . . . (of classification results relating to different input data, e.g. multimodal recognition)
2009/6294 . . . . (belief theory, e.g. Dempster-Shafer)
2009/6295 . . . . (fusion by voting)
9/6296 . . . . (Graphical models, e.g. Bayesian networks (probabilistic networks per se G06N 7/005))
Patterns, e.g. a word recognised identity of a number of successive using context analysis based on the provisionally relevant } , e.g. addressable memory sequence of the image signals or the references is with a plurality of references { in which the e.g. resistor matrix references adjustable by an adaptive method, e.g. learning using sequential comparisons of the image signals with a plurality of references { in which the sequence of the image signals or the references is relevant }, e.g. addressable memory Dividing the references in groups prior to recognition, the recognition taking place in steps; Selecting relevant dictionaries) { according to the graphical properties Alphabet recognition, e.g. Latin, Kanji, Katakana Font recognition Discrimination between machine-print, hand-print and cursive writing according to the linguistic properties, e.g. English, German Involving plural approaches, e.g. verification by template match; resolving confusion among similar patterns, e.g. O & Q (G06K 9/6807 takes precedence) Coarse/fine approaches, e.g. resolution of ambiguities, multiscale approaches Combination of methods, e.g. classifiers, working on the same input data Combination of methods, e.g. classifiers, working on different input data, e.g. sensor fusion Syntactic or structural pattern recognition, e.g. symbolic string recognition Syntactic analysis, e.g. using a grammatical approach (syntactic image representation G06K 9/4685) Graph matching (graphical image representation G06K 9/4689) the selection of the next reference depending on the result of the preceding comparison using context analysis based on the provisionally recognised identity of a number of successive patterns, e.g. a word [Lexical context (G06K 9/00872 takes precedence)] Syntactic or semantic context, e.g. balancing Arrangements for recognition using optical reference masks (optical analogue correlation G06F 3/03); arrangements for optically extracting non-holistic features, e.g. optical wedge-ring detectors. (G06K 9/58)) (using frequency domain filters, e.g. Fourier masks implemented on spatial light modulators (spatial light modulators per se G02B 26/00, G02F)) (characterised by the kind of filter) (the filter being related to phase processing, e.g. phase-only filters) (the filter being related to the combination of filters, e.g. synthetic discriminant filters) (using spatial domain filters, e.g. joint transform correlators) using holographic masks Combination of image acquisition and recognition functions Combination of image preprocessing and recognition functions using optical means in one or both functions Methods or arrangements for graph-reading or for converting the pattern of mechanical parameters, e.g. force or presence, into electrical signal (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) Automatic curve followers , i.e. arrangements in which an exploring member or beam is forced to follow the curve) using an auxiliary scanning pattern Devices for converting the position of a manually-operated writing or tracing member into an electrical signal { (arrangements for converting the position or the displacement of a member into a coded form G06F 3/03)} 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) the record carrier having longitudinal dimension comparable with transverse dimension, e.g. punched card Details, e.g. flaps in card-sorting apparatus Capstans; Pinch rollers Guiding cards; Checking correct operation of card-conveying mechanisms Aligning cards Checking presence, absence, correct position, or moving status of cards
13/07 . . . Transporting of cards between stations
13/073 . . . with continuous movement
13/077 . . . with intermittent movement; Braking or stopping movement
13/08 . . . Feeding or discharging cards
13/0806 . . . [using an arrangement for ejection of an inserted card]
13/0812 . . . [the ejection arrangement utilizing a push bar for manipulation by hand in order to eject the inserted card]
13/0818 . . . [the push bar comprising a pivotable push button]
13/0825 . . . [the ejection arrangement being of the push-push kind]
13/0831 . . . [the ejection arrangement comprising a slide, carriage or drawer]
13/0837 . . . [the ejection arrangement using a heart-shaped cam]
13/0843 . . . [from or back into the same magazine (automatic card files G06K 17/0003)]
13/085 . . . [using an arrangement for locking the inserted card]
13/0856 . . . [the locking arrangement comprising a notch in the card and a complementary locking means in the card reading station]
13/0862 . . . [the locking arrangement being of the rotate-slide and lock type, such as, e.g. common in mobile phones]
13/0868 . . . [using an arrangement for keeping the feeding or insertion slot of the card station clean of dirt, or to avoid feeding of foreign or unwanted objects into the slot]
13/0875 . . . [the arrangement comprising a shutter for blocking at least part of the card insertion slot]
13/0881 . . . [the shutter arranged to open only if the record carrier has been authenticated to enter the insertion slot]
13/0887 . . . [the arrangement comprising a size filter for filtering out only cards having the proper size]
13/0893 . . . [the arrangement comprising means for cleaning the card upon insertion]
13/10 . . . from magazine to conveying arrangement
13/103 . . . using mechanical means
13/107 . . . using pneumatic means
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
13/28 . . . continuously
13/30 . . . intermittently
15/00 Arrangements for producing a permanent visual presentation of the output data, e.g. computer output printers (printing or plotting combined with another operation, e.g. with conveying, G06K 17/00)
15/002 . . . [Interacting with the operator]
15/005 . . . [only locally]
15/007 . . . [only remotely, e.g. at a host computer (dedicated computer interfaces to print systems G06F 3/1201)]
15/007 . . . using printers
15/021 . . . [Adaptations for printing on specific media]
15/022 . . . [for printing on continuous media, e.g. tapes]
15/023 . . . [for printing on transparent media]
15/024 . . . [for printing on segmented surfaces, e.g. sticker sheets, label rolls]
15/025 . . . [Simulating output on another printing arrangement, e.g. proof output (matching two or more picture signal generators or two or more picture reproducers H04N 1/0652)]
15/026 . . . [introduction of proof output parameters]
15/027 . . . [Test patterns and calibration (arrangements for controlling or analysing printing mechanisms of typewriters or selective printing units B41J 29/39) takes precedence; colour correction using test pattern analysis in general H04N 1/0633)]
15/028 . . . [by thermal printers]
15/029 . . . [using optical beams]
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
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 (G06K 15/028 takes precedence)
15/102 . . . [using ink jet print heads]
15/105 . . . [Multipass or interlaced printing]
15/107 . . . [Mask selection]
15/12 . . . by photographic printing, e.g. by laser printers
15/1204 . . . [involving the fast moving of an optical beam in the main scanning direction (G06K 15/1233 - G06K 15/129 take precedence)]
15/1209 . . . [Intensity control of the optical beam (G06K 15/1233 takes precedence)]
15/1214 . . . [by feedback]
15/1219 . . . [Detection, control or error compensation of scanning velocity or position, e.g. synchronisation (G06K 15/1233 takes precedence)]
15/1223 . . . [Resolution control, enlarging or reducing, edge or detail enhancement]
15/1228 . . . [involving the fast moving of a light beam in two directions (G06K 15/1233 - G06K 15/129 take precedence)]
15/1233 . . . [using a cathode-ray tube or an optical-fibre tube]
15/1238 . . . [simultaneously exposing more than one point]
15/1242 . . . [on one main scanning line]
15/1247 . . . [using an array of light sources, e.g. a linear array]
15/1252 . . . [using an array of light modulators, e.g. a linear array]
15/1257 . . . [on more than one main scanning line]
15/1261 . . . [using an array of light sources]
15/1266 . . . [using a moving array]
15/1271 . . . [by light beam splitting]
or parsing G06F 3/1244
G06K 15/028
specific to a type of printer see
physical printing elements (for data conditioning
subgroups
{ Conditioning data for presenting it to the
-G06K 15/14
})
Means for paper feeding or form feeding
precedence )
magnetographic printing { ( G06K 15/12
by electrographic printing, e.g. xerography; by

{ Transforming generic data }
{ Accessing generic data, e.g. fonts }
{ Input data handling means }
{ Analysing the received data before
processing }
{ for evaluating the resources needed, e.g.
ink, paper stock }
{ adapting the print data to an output
condition, e.g. object trapping (trapping on
rasterized data H04N 1/58)

{ Object trapping }
{ Accessing generic data, e.g. fonts }
{ characterized by the kind of storage
accessed }
{ removable memories, e.g. font
 cartridges }
{ characterized by the format of the data }
{ compressed bitmaps }
{ outlined coded data }
{ transforming generic data }
{ Rasterization }
{ from outline-coded data }
{ from skeleton-coded data }
{ from compressed bitmap data }

{ page description language recognition }
{ sending feedback on the reception process
to the data source, e.g. indication of full
buffer }
{ analysing the received data before
processing }
{ for evaluating the resources needed, e.g.
rasterizing time, ink, paper stock }
{ adapting the print data to an output
condition, e.g. object trapping (trapping on
rasterized data H04N 1/58)

{ Object trapping }
{ Accessing generic data, e.g. fonts }
{ characterized by the kind of storage
accessed }
{ removable memories, e.g. font
cartridges }
{ characterized by the format of the data }
{ compressed bitmaps }
{ outlined coded data }
{ transforming generic data }
{ Rasterization }
{ from outline-coded data }
{ from skeleton-coded data }
{ from compressed bitmap data }

{ generating or processing printable items, e.g.
characters }
{ holographic scanning (in general G02B)
}{ colour printing }
{ using a particular photoreceptive medium }
{ by electrographic printing, e.g. xerography; by
magnetographic printing ( G06K 15/12 takes
precedence )

{ Depleting generic raster data, e.g. characters
(G06K 15/1843 takes precedence)
{ with provisions for image feature
conservation or enhancement, e.g. character edge
{ generation of the printable image
{ using an intermediate representation, e.g. a
list of graphical primitives
{ parted in a plurality of segments per
page
{ involving combining data of different
types
{ combining raster data of different
resolutions
{ combining raster data and graphic
primitives
{ characterized by its workflow
{ involving parallel processing in the same
printing apparatus
{ involving data processing distributed
amongst different data processing
apparatus
{ taking account of feedback from an
output condition, e.g. available inks, time
constraints
{ taking account of a limited available
memory space or rasterization time
{ by rasterizing in sub-page segments
{ by reducing the depth of some image
elements' definition
{ by compressing the rasterized print
data
{ post-processing of the composed and
rasterized print image (scanning, transmission
or reproduction of documents H04N 1/00)
{ for fitting to an output condition, e.g. paper
colour or format
{ depleting the print image
{ with provisions for image features
conservation or enhancement, e.g. conservation
or enhancement of zone edges

{ image enhancement
{ increasing spatial resolution; Anti-
aliasing
{ with provisions for treating some of the
print data differently
{ decreasing spatial resolution; Dithering
{ with provisions for treating some of the
print data differently
{ adjusting colours (image colour
correction or control for documents in
general H04N 1/60)
{ with provisions for treating some of the
print data differently
{ Halftoning (halftoning of still images in
general H04N 1/405, H04N 1/52)
{ involving operator action
{ for choosing a level of output quality

{ Receiving generic data, e.g. fonts, colour
palettes
{ receiving particular commands
{ receiving printer configuration
commands
{ receiving job control commands
{ relating to the print image preparation
{ relating to the printing process
{ receiving print data characterized by its
formatting, e.g. particular page description
languages
{ including high level document
description only
{ Page description language recognition
{ including print-ready data, i.e. data
already matched to the printing process
{ receiving print data in mixed format
{ Buffers
{ Adaptations for accepting data from more
than one source (managing interfaces
G06K 15/4045)
{ for a same print job
{ sending feedback on the reception process
to the data source, e.g. indication of full
buffer }
{ analysing the received data before
processing }
{ for evaluating the resources needed, e.g.
rasterizing time, ink, paper stock }
{ adapting the print data to an output
condition, e.g. object trapping (trapping on
rasterized data H04N 1/58)

{ Object trapping }
{ Accessing generic data, e.g. fonts }
{ characterized by the kind of storage
accessed }
{ removable memories, e.g. font
cartridges }
{ characterized by the format of the data }
{ compressed bitmaps }
{ outlined coded data }
{ transforming generic data }
{ Rasterization }
{ from outline-coded data }
{ from skeleton-coded data }
{ from compressed bitmap data }

{ geometric transformations, e.g. on raster
data
{ changing size or raster resolution
{ anti-aliasing raster data (G06K 15/1843
takes precedence)
{ depleting generic raster data, e.g. characters
(G06K 15/1843 takes precedence)
{ with provisions for image feature
conservation or enhancement, e.g. character edge
{ generation of the printable image
{ using an intermediate representation, e.g. a
list of graphical primitives
{ parted in a plurality of segments per
page
{ involving combining data of different
types
{ combining raster data of different
resolutions
{ combining raster data and graphic
primitives
{ characterized by its workflow
{ involving parallel processing in the same
printing apparatus
{ involving data processing distributed
amongst different data processing
apparatus
{ taking account of feedback from an
output condition, e.g. available inks, time
constraints
{ taking account of a limited available
memory space or rasterization time
{ by rasterizing in sub-page segments
{ by reducing the depth of some image
elements' definition
{ by compressing the rasterized print
data
{ post-processing of the composed and
rasterized print image (scanning, transmission
or reproduction of documents H04N 1/00)
{ for fitting to an output condition, e.g. paper
colour or format
{ depleting the print image
{ with provisions for image features
conservation or enhancement, e.g. conservation
or enhancement of zone edges

{ Image enhancement
{ Increasing spatial resolution; Anti-
aliasing
{ with provisions for treating some of the
print data differently
{ decreasing spatial resolution; Dithering
{ with provisions for treating some of the
print data differently
{ adjusting colours (image colour
correction or control for documents in
general H04N 1/60)
{ with provisions for treating some of the
print data differently
{ Halftoning (halftoning of still images in
general H04N 1/405, H04N 1/52)
{ involving operator action
{ for choosing a level of output quality

CPC - 2021.01
15/1885 . . . . [for modifying the layout of a document]
15/1886 . . . . [Storage of the print image data or of parts thereof]
15/1888 . . . . [Storage of image elements as generic data]
15/1889 . . . . [Merging with other data]
15/189 . . . . [adding a background, e.g. a pattern]
15/1892 . . . . [adding a digitally readable background pattern]
15/1893 . . . . [Form merging]
15/1894 . . . . [Outputting the image data to the printing elements]
15/1896 . . . . [by means of alternately addressed storages]
15/1897 . . . . [while merging on-the-fly with other data]
15/1898 . . . . [while adapting the order of the data to the printing elements' arrangement, e.g. row-to-column conversion]
15/22 . . . . using plotters
15/225 . . . . [using optical plotters]
15/40 . . . . [Details not directly involved in printing, e.g. machine management, management of the arrangement as a whole or of its constitutive parts (computer driven print job management G06F 3/1237)]
15/4005 . . . . [Sharing resources or data with other data processing systems; Preparing such data (for distributed printing G06K 15/1859)]
15/401 . . . . [Sharing memory space]
15/4015 . . . . [Sharing generic data descriptions, e.g. fonts, colour palettes, rasterized objects]
15/402 . . . . [Sharing data concerning the arrangement's configuration or current state (for managing optional units G06K 15/4025)]
15/4025 . . . . [Managing optional units, e.g. sorters, document feeders]
15/403 . . . . [handling the outputted documents, e.g. staplers, sorters]
15/4035 . . . . [Managing mailboxes]
15/404 . . . . [Managing other optional outputs, e.g. collators, staplers]
15/4045 . . . . [Managing the interface to the data source, e.g. choosing an interface for data reception]
15/405 . . . . [Choosing a data source, e.g. on a network]
15/4055 . . . . [Managing power consumption, e.g. standby mode (computer driven power saving management for a printer G06F 3/1221; power saving in a data processing device in general G06F 1/32)]
15/406 . . . . [Wake-up procedures (start-up of a laser scanner G06K 15/1219)]
15/4065 . . . . [Managing print media, e.g. determining available sheet sizes (feeding means G06K 15/16)]
15/407 . . . . [Managing marking material, e.g. checking available colours]
15/4075 . . . . [Determining remaining quantities of ink or toner]
15/408 . . . . [Handling exceptions, e.g. faults (computer driven error handling and recovery for a printer G06F 3/1234)]
15/4085 . . . . [Handling paper jams]
15/409 . . . . [Handling power failures]
15/4095 . . . . [Secure printing (computer driven secure printing G06F 3/1238)]
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
17/0003 . . . . [Automatic card files incorporating selecting, conveying and possibly reading and/or writing operations]
17/0006 . . . . [with random access selection of a record carrier from the card-file, e.g. the carriers are suspended on the selection device which in part of the card magazine]
17/0009 . . . . [with sequential access selection of a record carrier from the card-file, e.g. relative movement between selecting device and card-file]
17/0012 . . . . [with more than one selection steps, e.g. selection of a record carrier from a selected compartment of a compartmented storage (storage devices for articles B65G 1/0407)]
17/0016 . . . . [Selecting or retrieving of images by means of their associated code-marks, e.g. coded microfilm or microfiche (microfilm reading G03B 21/11; computer therefor G06F 16/00; teaching devices G09B 5/02; accessing record carriers G11B 27/002; static digital stores using optical elements G11C 13/04; intermediate storage of facsimile picture signals H04N 1/21)]
17/0019 . . . . [for images on filmstrips]
17/0022 . . . . [arrangements or provisions for transferring data to distant stations, e.g. from a sensing device ("transfer between computer elements G06F 13/00"); data-transmission H04L]
17/0025 . . . . [the arrangement consisting of a wireless interrogation device in combination with a device for optically marking the record carrier]
17/0029 . . . . [the arrangement being specially adapted for wireless interrogation of grouped or bundled articles tagged with wireless record carriers]
17/0032 . . . . [Apparatus for automatic testing and analysing marked record carriers, used for examinations of the multiple choice answer type (teaching apparatus working with questions and answers G09B 7/00)]
19/00 Record carriers for use with machines and with at least a part designed to carry digital markings
19/005 . . . . [the record carrier comprising an arrangement to facilitate insertion into a holding device, e.g. an arrangement that makes the record carrier fit into an etui or a casing (ticket holders A45C 11/18)]
19/02 . . . . [characterised by the selection of materials, e.g. to facilitate wear during transport through the machine]
19/022 . . . . [Processes or apparatus therefor]
19/025 . . . . [the material being flexible or adapted for folding, e.g. paper or paper-like materials used in luggage labels, identification tags, forms or identification documents carrying RFIDs (methods for testing the genuineness of valuable papers, e.g. banknotes or passports G07D 7/00; constructional features of booklets and the like B42D)
characterised by the kind of the digital marking, e.g. (G06K 19/063 take precedence)

comprising galvanic contacts for contacting an integrated circuit chip thereon

... (the record carrier being of the non-contact type, e.g. RFID, and being specially adapted for attachment to a disc, e.g. a CD or DVD)

... (the record carrier being shaped as a coin or a gambling token)

... (the record carrier being shaped as a key)

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

... (with optically detectable marking (G06K 19/063, G06K 19/08 take precedence))

... (one-dimensional coding)

... (using bar codes)

... (multi-dimensional coding)

... (Constructional details)

... (the marking comprising a further embedded marking, e.g. a 1D bar code with the black bars containing a smaller sized coding)

... (the marking being at least partially represented by holographic means (holographic marking in general, see G06K 19/16))

... (the marking containing means for error correction)

... (the marking being based on nanoparticles or microbeads)

... (the marking being constructed out of a plurality of similar markings, e.g. a plurality of barcodes randomly oriented on an object)

... (the marking being embedded in a human recognizable image, e.g. a company logo with an embedded two-dimensional code)

... (the marking being simulated using a light source, e.g. a barcode shown on a display or a laser beam with time-varying intensity profile)

... (the marking having been punched or cut out, e.g. a barcode machined in a metal work-piece)

... (the marking comprising a target pattern, e.g. for indicating the center of the bar code or for helping a bar code reader to properly orient the scanner or to retrieve the bar code inside of an image)

... (the marking being selective to wavelength, e.g. color barcode or barcodes only visible under UV or IR (methods or arrangements for sensing record carriers using a selected wavelength, see G06K 7/12))

... (the marking being of the rewritable type, e.g. thermo-chronic barcodes)

... (the marking being relief type, e.g. three-dimensional bar codes engraved in a support)

... (the marking being a concentric barcode)

... (the marking having a feature size being smaller than can be seen by the unaided human eye)

... (with magnetically detectable marking)

... (Constructional details)

... (the magnetic marking being emulated)

... (Aspects not covered by other subgroups)

... (with magnetically detectable marking)

... (using wavelength selection, e.g. colour code)

... (miniature-code)

... (concentric-code)

... (for a specific application)

... (with target- or other orientation-indicating feature)

... (Relief-type marking)

... (rewritable)

... (Holographic, diffractive or retroreflective recording)

... the carrier being marginally punched or notched, e.g. having elongated slots

... Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards { also with resonating or circuits or semiconductor circuit elements, e.g. credit or identity cards

... with target- or other orientation-indicating feature

... the source being electromagnetic or magnetic

... (the source being a field other than an interrogation field, e.g. WLAN, cellular phone network)

... (the source being mechanical or acoustical)
19/0712 . . . . [the arrangement being capable of triggering distinct operating modes or functions dependent on the strength of an energy or interrogation field in the proximity of the record carrier (active means for hindering electromagnetic reading or writing G06K 19/07336)]
19/0713 . . . . [the arrangement including a power charge pump]
19/0715 . . . . [the arrangement including means to regulate power transfer to the integrated circuit]
19/0716 . . . . [at least one of the integrated circuit chips comprising a sensor or an interface to a sensor]
19/0717 . . . . [the sensor being capable of sensing environmental conditions such as temperature history or pressure]
19/0718 . . . . [the sensor being of the biometric kind, e.g. fingerprint sensors (fingerprint sensors in general, see G06K 9/00; biometric access-control systems in general, see G07C 9/00)]
19/0719 . . . . [at least one of the integrated circuit chips comprising an arrangement for application selection, e.g. an acceleration sensor or a set of radio buttons (application selection on smart cards using pure software control, see G07F 7/10)]
19/072 . . . . [the record carrier comprising a plurality of integrated circuit chips]
19/0721 . . . . [the plurality of chips mutually cooperating so as to represent itself to the world as a single entity]
19/0722 . . . . [comprising an arrangement for testing the record carrier]
19/0723 . . . . [the record carrier comprising an arrangement for non-contact communication, e.g. wireless communication circuits on transponder cards, non-contact smart cards or RFID]
19/0724 . . . . [the arrangement being a circuit for communicating at a plurality of frequencies, e.g. for managing time multiplexed communication over at least two antennas of different types]
19/0725 . . . . [the arrangement being a circuit for emulating a plurality of record carriers, e.g. a single RFID tag capable of representing itself to a reader as a cloud of RFID tags]
19/0726 . . . . [the arrangement including a circuit for tuning the resonance frequency of an antenna on the record carrier]
19/0727 . . . . [the arrangement being a circuit facilitating integration of the record carrier with a hand-held device such as a smart phone of PDA]
19/0728 . . . . [the arrangement being an optical or sound-based communication interface]
19/073 . . . . [Special arrangements for circuits, e.g. for protecting identification code in memory (protection against unauthorised use of computer memory G06F 12/14)]
19/07309 . . . . [Means for preventing undesired reading or writing from or onto record carriers]
19/07318 . . . . [by hindering electromagnetic reading or writing (jamming of communication, counter-measures H04K 3/00; secret communication H04K 1/00)]
19/07327 . . . . [Passive means, e.g. Faraday cages (Faraday-type protection of electric circuits in general H05K 9/00)]
19/07336 . . . . [Active means, e.g. jamming or scrambling of the electromagnetic field]
19/07345 . . . . [by activating or deactivating at least a part of the circuit on the record carrier, e.g. ON/OFF switches]
19/07354 . . . . [by biometrically sensitive means, e.g. fingerprint sensitive (fingerprint sensors in general G06K 9/0006; biometrically activated access control G07C 9/25)]
19/07363 . . . . [by preventing analysis of the circuit, e.g. dynamic or static power analysis or current analysis]
19/07372 . . . . [by detecting tampering with the circuit]
19/07381 . . . . [with deactivation or otherwise incapacitation of at least a part of the circuit upon detected tampering]
19/0739 . . . . [the incapacitated circuit being part of an antenna]
19/077 . . . . [Constructional details, e.g. mounting of circuits in the carrier]
19/07701 . . . . [the record carrier comprising an interface suitable for human interaction]
19/07703 . . . . [the interface being visual]
19/07705 . . . . [the visual interface being a single light or small number of lights capable of being switched on or off, e.g. a series of LEDs]
19/07707 . . . . [the visual interface being a display, e.g. LCD or electronic ink]
19/07709 . . . . [the interface being a keyboard]
19/07711 . . . . [the interface being an audio interface]
19/07713 . . . . [the interface, upon reception of an interrogation signal, being capable of signaling to indicate its position to a user or a detection device]
19/07715 . . . . [the interface being used to indicate that the record carrier is active, e.g. a blinking light to indicate that the record carrier isbusy communicating with a secondary device or busy computing]
19/07716 . . . . [the record carrier comprising means for customization, e.g. being arranged for personalization in batch]
19/07718 . . . . [the record carrier being manufactured in a continuous process, e.g. using endless rolls]
19/0772 . . . . [Physical layout of the record carrier]
19/07722 . . . . [the record carrier being multilayered, e.g. laminated sheets (flat articles in general, see B32B 37/00)]
19/07724 . . . . [the record carrier being at least partially made by a molding process (molding in general B29C 45/14)
smart card } details of the antenna of a non-contact contact communication, e.g. constructional
the record carrier being capable of non-
mounting details of integrated circuit
card )
chips being mounted as a module
arrangements for adhering the record
carrier to further objects or living
beings, functioning as an identification
tag
the adhering arrangement being a
layer of adhesive, so that the record
carrier can function as a sticker
[the record comprising means for indicating first use, e.g. a frangible layer]
[the record carrier comprising means for protection against impact or bending,
e.g. protective shells or stress-absorbing layers around the integrated circuit]
[the record carrier comprising means to protect itself against external heat sources]
[the record carrier having a housing or construction similar to well-known
durable memory devices, such as SD cards, USB or memory sticks ( housings for electrical equipment in general, see H05K 5/02 )]
[the record carrier containing at least one further contact interface not
conform ISO-7816]
[the record carrier comprising means for protecting against electrostatic discharge]
[the record carrier consisting of two or more mechanically separable parts]
[comprising a first part capable of functioning as a record carrier on its own and a second part being only functional as a form factor changing part, e.g. SIM cards type ID 0001, removably attached to a regular smart card form factor]
[comprising a first part operating as a regular record carrier and a second attachable part that changes the functional appearance of said record carrier, e.g. a contact-based smart card with an adapter part which, when attached to the contact card makes the contact card function as a non-contact card]
[External electrical contacts]
[Mounting details of integrated circuit chips]
[at least one of the integrated circuit chips being mounted as a module]
[the record carrier being capable of non-contact communication, e.g. constructional details of the antenna of a non-contact smart card]
[arrangements for connecting the integrated circuit to the antenna]
[using an interposer]
[the connection being galvanic]
[the connection being non-galvanic, e.g. capacitive]
[arrangements for adhering the record carrier to further objects or living beings, functioning as an identification tag]
[the adhering arrangement making the record carrier wearable, e.g. having the form of a ring, watch, glove or bracelet ( record carriers for insertion in the human body for medical purposes A61B 9/00 ; record carriers adapted for attachment to animals A01K 11/00 )]
[the adhering arrangement making the record carrier attachable to a tire ( tire temperature or pressur control arrangements, see B60C 23/00 )]
[comprising at least a second communication arrangement in addition to a first non-contact communication arrangement]
[the first and second communication means being two different antennas types, e.g. dipole and coil type, or two antennas of the same kind but operating at different frequencies]
[the further communication means being a galvanic interface, e.g. hybrid or mixed smart cards having a contact and a non-contact interface]
[the record carrier comprising means for minimising adverse effects on the data communication capability of the record carrier, e.g. minimising Eddy currents induced in a proximate metal or otherwise electromagnetically interfering object]
[Antenna details ( antennas for wireless devices, e.g. RFID tags, in general H01Q 1/22 )]
[the antenna being on-chip]
[the antenna being of the inductive type]
[the inductive antenna being a coil]
[the coil being fabricated in a winding process]
[the coil being planar]
[the inductive antenna consisting of a plurality of coils stacked on top of one another]
[the antenna being of the HF type, such as a dipole]
[the antenna being of the capacitive type]
[the antenna being foldable or folded]
[the antenna adapted for extending in three dimensions]
[the record carrier comprising a booster or auxiliary antenna in addition to the antenna connected directly to the integrated circuit]
[arrangements on the record carrier to allow stacking of a plurality of similar record carriers, e.g. to avoid interference between the non-contact communication of the plurality of record carriers]
Other aspects

2207/1011 . Aiming
2207/1012 . Special detection of object
2207/1013 . Multi-focal
2207/1015 . Hologram
2207/1016 . Motor control or optical moving unit control
2207/1017 . Programmable

2207/1018 . Source control

2209/00 Indexing scheme relating to methods or arrangements for reading or recognising printed or written characters or for recognising patterns, e.g. fingerprints

2209/01 . Character recognition
2209/011 . of Kanji, Hiragana or Katakana characters
2209/013 . of non-latin characters other than Kanji, Hiragana or Katakana characters
2209/015 . Solutions for problems related to non uniform document background
2209/03 . Recognising information on displays, dials, clocks
2209/05 . Recognition of patterns in medical or anatomical images
2209/051 . of internal organs
2209/053 . of protuberances, polyps nodules, etc.
2209/055 . of skeletal patterns
2209/057 . of medical instruments
2209/07 . Recognition of patterns in DNA microarray
2209/09 . Recognition of patterns representing particular kinds of hidden objects, e.g. weapons, explosives, drugs
2209/15 . Detection and recognition of car license plates
2209/17 . Recognition of food, fruit, vegetables
2209/19 . Recognition of objects for industrial automation
2209/21 . Target detection
2209/23 . Detecting or categorising vehicles
2209/25 . Recognition of logos
2209/27 . Recognition assisted with metadata
2209/29 . Technique has transformation invariance effect
2209/40 . Acquisition of 3D measurements of objects
2209/401 . using special illumination
2209/403 . Computational image measurements in electron microscopy
2209/50 . Indexing scheme for indicating the type of disclosure document
2209/501 . Book
2209/502 . Book chapter
2209/503 . Survey article
2209/504 . Technical report or standard
2209/505 . Master, PhD or other thesis
2209/506 . Tutorial

2215/00 Arrangements for producing a permanent visual presentation of the output data

2215/002 . Handling the output data
2215/005 . Accepting output data; Preparing data for the controlling system
2215/008 . Downloading generic data
2215/011 . characterised by a particular command or data flow, e.g. Page Description Language, configuration commands
2215/014 . Transforming the printer input data into internal codes
2215/017 . Preparing data for the controlling system, e.g. status, memory data
2215/002 . Generic data access
2215/0022 . characterised by the storage means used
2215/0025 . Removable memories, e.g. cartridges
2215/0028 . characterised by the format per sec
2215/0031 . Compressed bit maps
2215/0034 . Outline coding
2215/0037 . depending on an output condition, e.g. size, resolution
Generic data transformation
Rasterisation
Converting outline to bitmap
Converting skeleton to bitmap
from compressed bitmap, e.g. run length
Geometric transformations, e.g. on rasterised data
Sizing and resolution changes
Anti-aliasing raster data
combining generic and host data, e.g. filling a raster
Page or partial page composition
Line composition, e.g. kerning
Post-treatment of the composed image, e.g. compression, rotation
Depleting the image
Raster outputting to the print element(s)
from more than one raster memory
Architecture adapted for a particular function
Error recovery
Collated printing
Outputting only video data, e.g. Hard copy of CRT display
Colour printing
Printing on special media, e.g. labels, envelopes
involving the use of ink jets
with overlapping swaths