

## G06K

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

#### Definition statement

*This place covers:*

Methods or arrangements for reading or recognizing printed or written characters or for recognizing patterns, e.g. fingerprints; for graph-reading or for converting the pattern of mechanical parameters into electrical signals; for printing of data in the shape of alphanumeric or other characters from a record carrier; for verifying the correctness of markings on a record carrier; for sensing record carriers; and for marking the record carrier in digital fashion.

Arrangements for producing a permanent visual presentation of the output data.

Column-detection devices.

Conveying record carriers from one station to another, e.g. from stack to punching mechanism.

Record carriers for use with machines and with at least a part designed to carry digital markings.

Information retrieval from punched cards designed for manual use or handling by machine, and apparatus for handling such cards, e.g. marking or correcting.

Arrangements for preparing the data output from a computer for printing, e.g. computer or network printers insofar as they are involved in outputting the result of a computation, like a document.

#### References

##### Limiting references

*This place does not cover:*

|                 |                      |
|-----------------|----------------------|
| Printing per se | <a href="#">B41J</a> |
|-----------------|----------------------|

##### Application-oriented references

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

|  |                            |
|--|----------------------------|
| Postal sorting   | <a href="#">B07C</a>       |
| Hand-held input or output devices for transferring data to be processed into a form capable of being handled by a digital computer, e.g. light-pens, joysticks, mice or trackballs | <a href="#">G06F 3/033</a> |

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| Transponders powered by received radio waves, e.g. passive transponders                     | <a href="#">G01S 13/75</a> |
| Tags attached to, or associated with, an object, in order to enable detection of the object | <a href="#">G01V 15/00</a> |
| Magnetic head applications  | <a href="#">G11B 5/31</a>  |
| Magnetic alloy thin films, such as used in magnetoresistive applications in magnetic heads  | <a href="#">G11B 5/39</a>  |

|  |                            |
|--|----------------------------|
| Magnetic alloy thin films, such as used in magnetic thin film media applications | <a href="#">G11B 5/64</a>  |
| Magnetic alloy thin films, such as used in static memory applications            | <a href="#">G11C 11/00</a> |
| Responders; Transponders   | <a href="#">H04B 1/59</a>  |
| Near-field transmission systems using transceiver                                | <a href="#">H04B 5/02</a>  |

### Special rules of classification

[G06K 17/00](#) covers methods or arrangements for effecting co-operative working between equipments covered by two or more main groups [G06K 1/00-G06K 15/00](#).

[G06K 9/00](#) takes precedence over [G06K 7/00](#).

[G06K 19/00](#) takes precedence over [G06K 21/00](#).

### Glossary of terms

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

|                |  |
|----------------|--|
| 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 or by electrical contacting or non-contacting means |
| Data           | is a synonym for information   |

## G06K 1/00

### Methods or arrangements for marking the record carrier in digital fashion (interpreting [G06K 3/02](#))

#### Definition statement

*This place covers:*

This groups covers details of card punching machines and methods using such machines as well as the printing of optically readable codes, such as barcodes, in particular in relation to the difficulties of said printing on the material being printed on.

#### Relationships with other classification places

[G06K 1/121](#) is related to [B41J](#) (printing in general). [G06K 1/126](#) is related to [B23K 26/00](#) (laser marking of workpieces, e.g. metal workpieces)

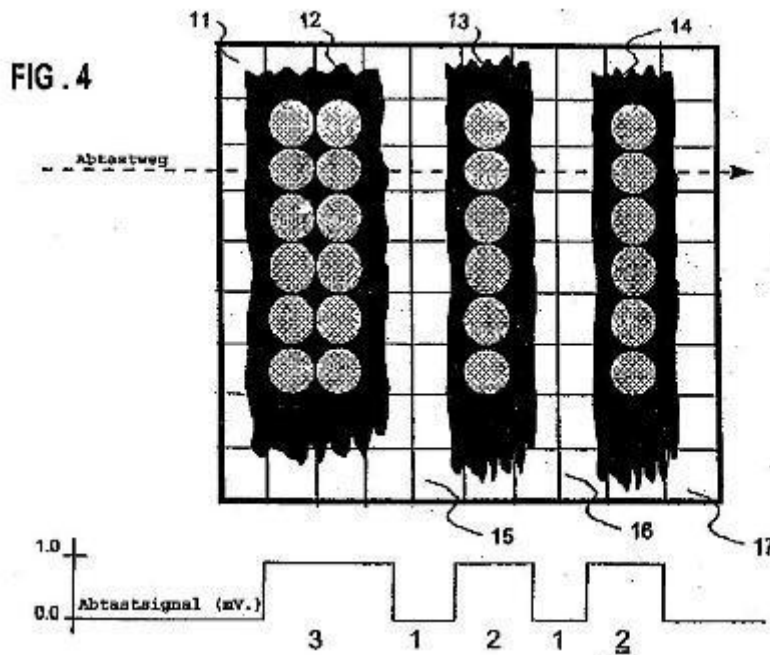
Reading and writing of magnetic stripes, RFIDs, and of smart cards is classified in [G06K 7/00](#).

#### Special rules of classification

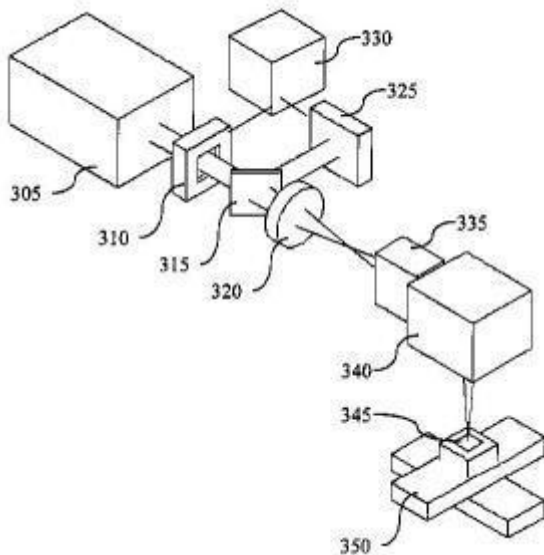
Methods of marking or printing of barcodes and other optically detectable digital codes should be classified in [G06K 1/12](#) and lower

Only [G06K 1/12](#) is presently active as the methods of card punching are practically obsolete.

Typically [G06K 1/121](#), problems associated to the difference between the theoretically desirable bar code and the real printed barcode and how this has its effect on the quality (readability) of the barcode:



and [G06K 1/126](#) typically is related to laser marking of optical codes, e.g. on workpieces:



This group was originally created for classification of various card punching systems and methods. With these systems being nowadays obsolete, the only relevant group being in use is that of [G06K 1/12](#) which focuses on methods and systems particular for marking machine readable codes such as bar codes on various substrates and the particular problems related thereto, e.g. to avoid bleeding in the printing process so that the bars constituting the barcode are "sharp".

### Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

- "barcode", "bar code", "optical code" and "marking"

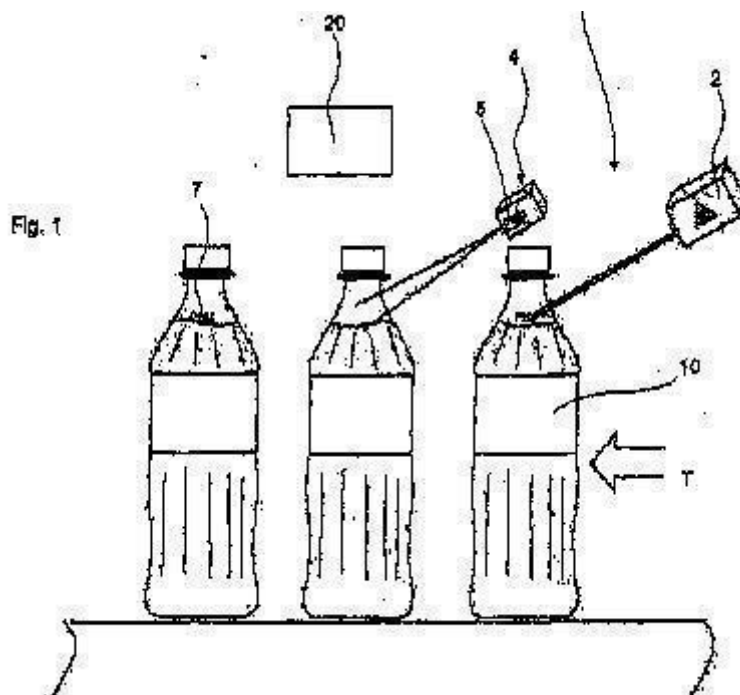
## G06K 5/00

### Methods or arrangements for verifying the correctness of markings on a record carrier; Column detection devices

#### Definition statement

*This place covers:*

- Methods or arrangements for verifying the correctness of markings on a record carrier;
- Column detection devices;
- Correctness of marking may be assessed by detecting physical properties, check-digit, plausibility check or by comparing with stored data.
- Examples:
- Bar code data is compared with data in memory,
- Spectral light of bar code is compared with predetermined spectrum;
- Production line with a marking device, followed by a verification device to check correctness of the marking; see illustration herebelow:



#### References

##### Limiting references

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Devices for scanning or checking the printed matter for quality control   | <a href="#">B41F 33/0045</a> |
| Error detection or correction by redundancy in data representation, e.g. by using checking codes.   | <a href="#">G06F 11/00</a>   |
| Testing paper currency, securities, bonds or similar valuable papers for genuineness by testing patterns thereon, e.g. comparing to a reference in a memory | <a href="#">G07D 7/20</a>    |

## G06K 7/00

**Methods or arrangements for sensing record carriers, {e.g. for reading patterns} ([G06K 9/00](#) takes precedence)**

### Definition statement

*This place covers:*

This group covers the arrangements for reading and writing of devices such as non-contact smart cards, contact smart cards, barcodes, magnetic stripes and other digitally records included on a handheld object, such as a card, or e.g. printed or otherwise included on a label for attachment to an object, for identification of the object.

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |                            |
|--|----------------------------|
| Identification of animals  | <a href="#">A01K 11/00</a> |
| Marking of poultry and the like  | <a href="#">A01K 35/00</a> |
| Receptacle for credit cards, such as etuis   | <a href="#">A45C 11/18</a> |
| Check-out counters, e.g. including a barcode scanner   | <a href="#">A47F 9/046</a> |
| Implanted circuitry (for diagnostics)  | <a href="#">A61B 5/00</a>  |
| Detecting for diagnostic purposes  | <a href="#">A61B 5/117</a> |
| Sorting of articles according to an identifier or destination marking  | <a href="#">B07C 3/18</a>  |
| Sorting using a machine readable code  | <a href="#">B07C 5/34</a>  |
| Printing of security markings  | <a href="#">B41M 3/14</a>  |
| Card filing arrangements   | <a href="#">B42C 17/00</a> |
| Printed mater of special format, e.g. identity or credit cards   | <a href="#">B42D 15/00</a> |
| Containers for laboratory use carrying an identifier, e.g. an RFID or barcode                                | <a href="#">B61L 3/14</a>  |
| Indicating train identities using tags   | <a href="#">B61L 25/04</a> |
| Transponders fixed to bicycles   | <a href="#">B62H 5/20</a>  |
| Labelling machines, e.g. fixing machines to fix a label with a bar code to a package                         | <a href="#">B65C</a>       |
| Refuse receptacles carrying identification means   | <a href="#">B65F 1/14</a>  |
| Article conveyance distributing the articles according to bodily destination marks, e.g. in production lines | <a href="#">B65G 47/49</a> |
| Stacking and de-stacking of flat articles, e.g. stacking plural card shaped objects                          | <a href="#">B65H</a>       |
| Marking arrangements for laundry purposes, e.g. to track laundry using RFID tags                             | <a href="#">D06F 93/00</a> |
| Paper including security elements, e.g. methods to create a paper support carrying an RFID                   | <a href="#">D21H 21/40</a> |
| Details of vessels, means for coding or identifying them   | <b>F17C123/00</b>          |
| Recording measures values, e.g. using sensors  | <a href="#">G01D 9/00</a>  |

|   |  |
|---|--|
| Position detection of objects using reflection of radio waves on passive responders, e.g. with exchange of information between interrogator and responder | <a href="#">G01S 13/00</a>   |
| Tags for enabling detection of objects, e.g. to locate underground oil pipes or landmines   | <a href="#">G01V 15/00</a>   |
| Optical elements, such as lenses  | <b>G02B5/99</b>  |
| Scanning systems  | <a href="#">G02B 26/10</a>   |
| Computer security in general  | <a href="#">G06F 21/00</a>   |
| Business methods using RFIDs or barcodes or the like  | <a href="#">G06Q</a>   |
| Tachographs using smart cards or the like for recording   | <a href="#">G07C 5/08</a>  |
| Access control using an identification card, opening of card doors using a transponder  | <a href="#">G07C 9/00</a>  |
| Payment using cards   | <a href="#">G07F 7/08</a> , <a href="#">G07F 7/10</a>                                |
| Cash registers using barcode scanning   | <a href="#">G07G 1/00</a>  |
| Partner search systems using transponders   | <a href="#">G08B 1/08</a>  |
| Anti-theft systems using transponders or the like   | <a href="#">G08B 13/24</a>   |
| Identification of vehicles  | <a href="#">G08G 1/017</a>   |
| Labels, tags, tickets and security seals  | <a href="#">G09F 3/02</a> , <a href="#">G09F 3/03</a> ,<br><a href="#">G09F 3/20</a> |
| Recording reproducing or erasing on magnetic carriers in general  | <a href="#">G11B 5/00</a>  |
| Optical recording on flat record carriers other than barcode recording  | <a href="#">G11B 7/00</a>  |
| Optical recording on CDs, DVDs and the like   | <a href="#">G11B 20/00</a> , <a href="#">G11B 23/00</a>                              |
| CD's with transponders  | <a href="#">G11B 23/20</a> , <a href="#">G11B 20/00</a>                              |
| Circuit means for protection against loss of information of semiconductor storage device, e.g. on cards against alpha rays inducing soft errors           | <a href="#">G11C 5/00</a>  |
| Contactless power supplies for memory stores  | <a href="#">G11C 5/14</a>  |
| Manufacturing coils not particular for non contact smart cards  | <a href="#">H01F 41/00</a>   |
| Cards including details of the manufacturing of the semiconductor device  | <a href="#">H01L 23/498</a> ,<br><a href="#">H01L 23/538</a>                         |
| Antennas design details   | <a href="#">H01Q 1/22</a>  |
| SAW circuits not for record carriers  | <a href="#">H03H 9/64</a>  |
| SIM card connection arrangements particular for mobile phones   | <a href="#">H04B 1/38</a>  |
| Near field transmission systems not RFID type   | <a href="#">H04B 5/00</a>  |
| Wireless local area networks  | <a href="#">H04L 12/28</a>   |
| Mobile phones with a barcode reading functionality  | <a href="#">H04M 1/7255</a>  |
| Digital cameras combined with a further device (e.g. a mobile phone)  | <a href="#">H04N 1/00</a>  |
| Wireless networks in general  | <a href="#">H04W</a>   |
| Conductive patterns on PCBs other than on smart cards   | <a href="#">H05K 3/10</a>  |
| Casings cabinets drawers for interchangeable modules  | <a href="#">H05K 5/02</a>  |
| Faraday type of protections of electrical circuits  | <a href="#">H05K 9/00</a>  |

## Special rules of classification

[G06K 7/0004](#) is for classification of combined arrangements, like a device incorporating a barcode reader and an RFID reader.

[G06K 7/0013](#) is for classification of constructional details and functions of contact card readers, such may be the housing of the reader, the entry slots of the reader, the peculiarities of the contact arrangements for contacting the contacts on the smart card or memory card, protection arrangements for protecting the circuits of the card reader against intrusion or unwanted inspection.

[G06K 7/084](#) is for classification of magnetic stripe reading arrangements. Typically these magnetic stripes are included on a card shaped object as the classical credit card.

[G06K 7/10009](#) is for classification of arrangements for interrogating wireless record carriers, such as RFIDs and non-contacts smart cards. Typically, the arrangements comprise arrangements to resolve collision between plural RFIDs that try communicating with an interrogator at the same time, arrangements for controlling the power of the interrogation field, arrangements allowing the interrogator to mimic an RFID or transponder or vice versa, protocols for RFID interrogators, protection arrangements and antenna arrangements adapted for RFID interrogation.

[G06K 7/10544](#) is for classification of constructional aspects of barcode reading arrangements, such as arrangements for focalisation, cameras, mirrors, handheld readers.

[G06K 7/1099](#) is for classification of arrangements using X-Rays to retrieve identification codes on objects.

[G06K 7/12](#) is for classification of barcode reading systems where the color of the light that is used is of importance, e.g. using UV or IR to illuminate invisible fluorescent barcodes.

[G06K 7/14](#) is primarily for classification of software for barcode readers in particular algorithms to locate or retrieve a barcode from an image.

[G06K 7/01](#), [G06K 7/02](#), [G06K 7/04](#), [G06K 7/06](#) are not used as the technology thereof is not in development anymore.

## Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

- "smart card connector", "card connector", "card reader", "interrogator", "RFID", "transponders" and "tag reader"

## G06K 7/0004

### {Hybrid readers}

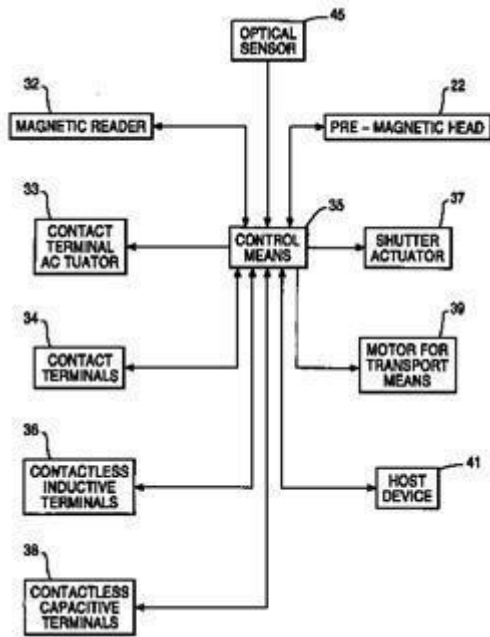
#### Definition statement

*This place covers:*

Reader/writers capable of handling different information recording principles, either on respective data carriers or on data carriers having information recorded according to a plurality of recording principles.

Examples:

- combined chip card / magnetic stripe card reader,
- combined contactless / contact IC-card readers,
- combined barcode / RFID readers.



**Special rules of classification**

In particular readers/writers that combine two types of readers in one and the same device and where a synergetic interaction between the two is present need to be classified inhere.



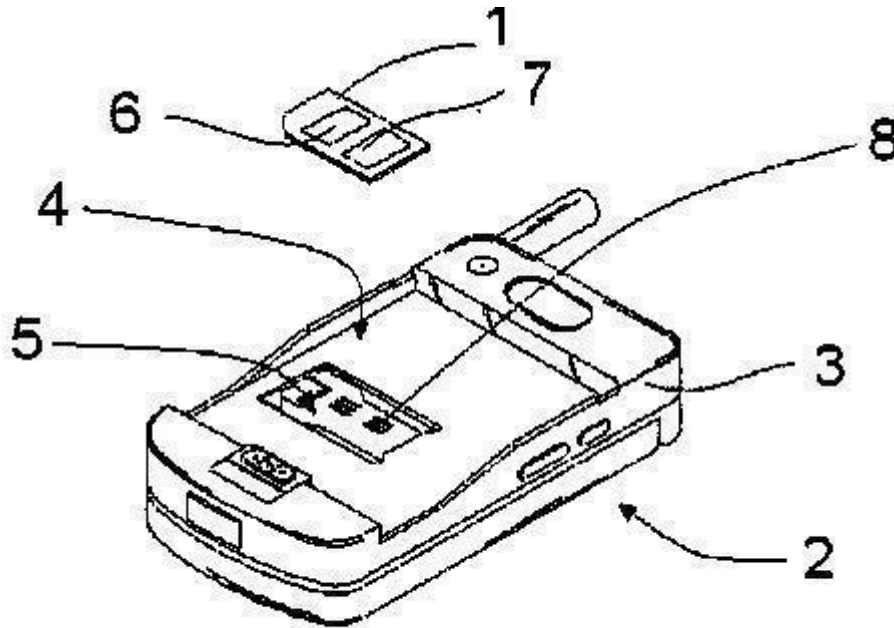
## G06K 7/0013

{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](#))}

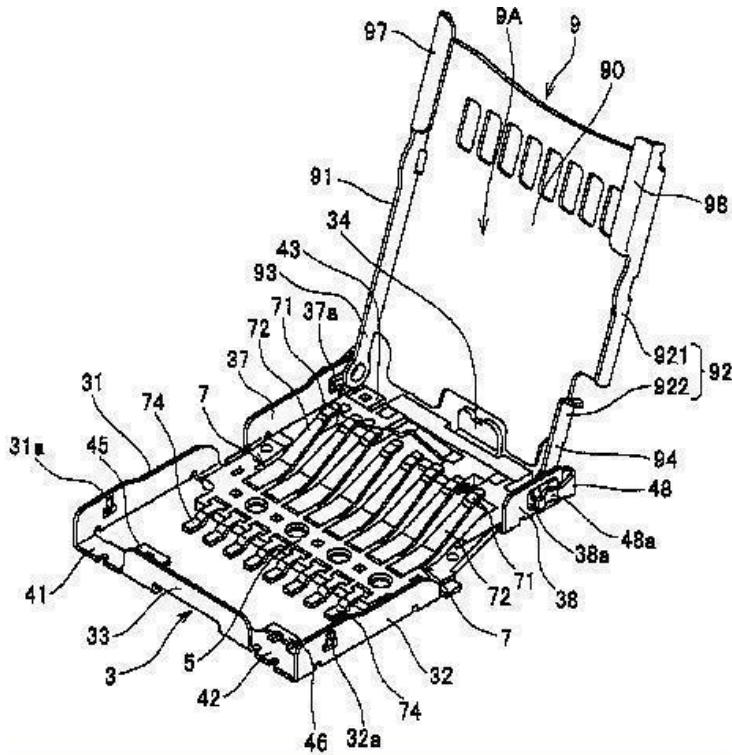
### Definition statement

*This place covers:*

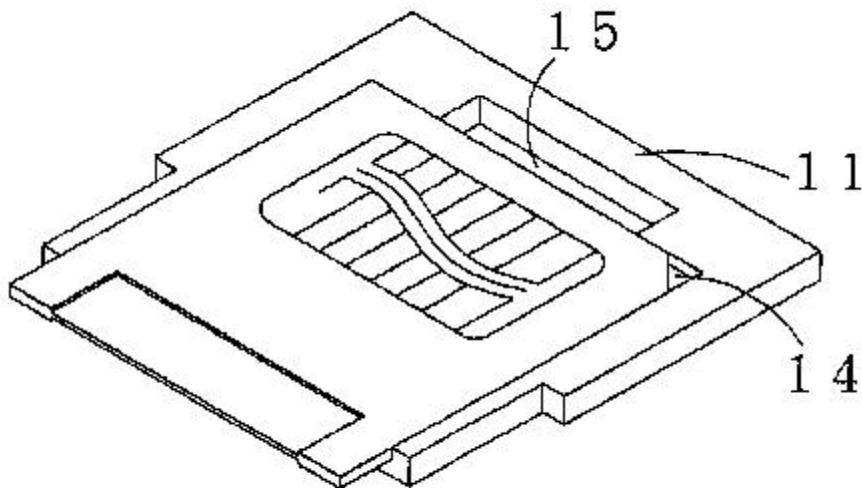
[G06K 7/0013](#) deals with arrangements for connecting a smart card to a card reader, for example:

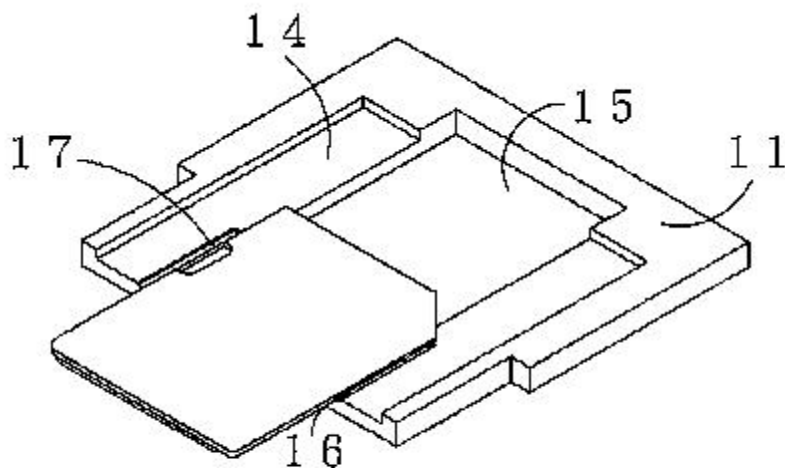
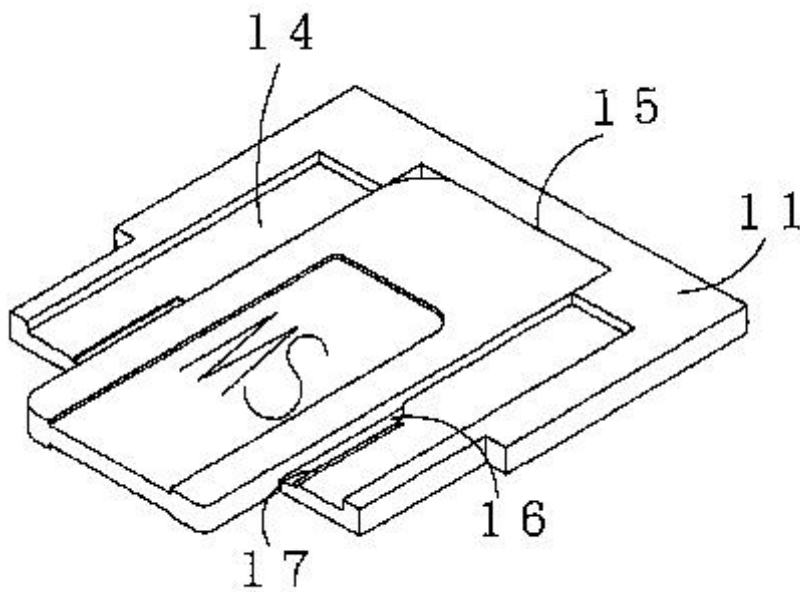


or



but also with arrangements for connecting a variety of memory cards, such as MMC, memory sticks, SD cards and the like; see illustration here below:





## G06K 7/10009

{sensing by radiation using wavelengths larger than 0.1 mm, e.g. radio-waves or microwaves}

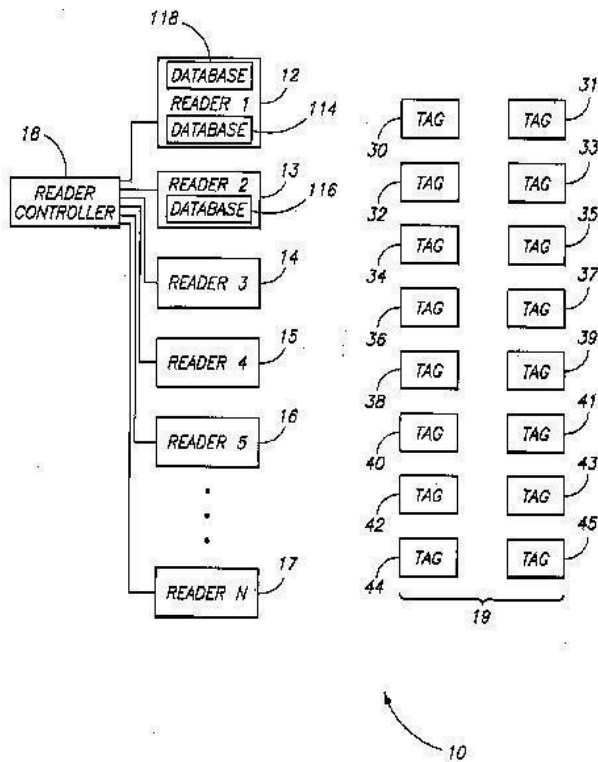
### Definition statement

*This place covers:*

Ancillary aspects of RFID interrogators such as collision resolution, energy usage, antenna arrangements and security of the interrogation process.

Example:

arrangement to interrogate a cloud of transponders.



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |   |
|--|---|
| Systems using the reflection or reradiation of radio waves, e.g. radar                     | <a href="#">G01S 13/75</a> , <a href="#">G01S 13/76</a> |
| Reading of smart cards, dongles, for authentication and access control in computer systems | <b>G06F21/00N5A2D2</b>                                  |
| Communication between electronic keys and locks, e.g. car keys with transponders           | <a href="#">G07C 9/00174</a>                            |
| Mutual authentication between data carrier and terminal or host                            | <b>G07F7/10D4</b>                                       |
| Transmitter circuits   | <a href="#">H04B 1/00</a>                               |
| Near field transmission systems  | <a href="#">H04B 5/00</a>                               |
| Transmission power control in radio transmission systems                                   | <a href="#">H04B 7/005</a>                              |
| Secure transmission, encryption, protection against differential power attacks (DPA)       | <a href="#">H04L 9/00</a>                               |
| Wireless local area networks, home automation  | <b>H04L12/28W</b>                                       |
| Wireless communication networks  | <a href="#">H04W</a>                                    |

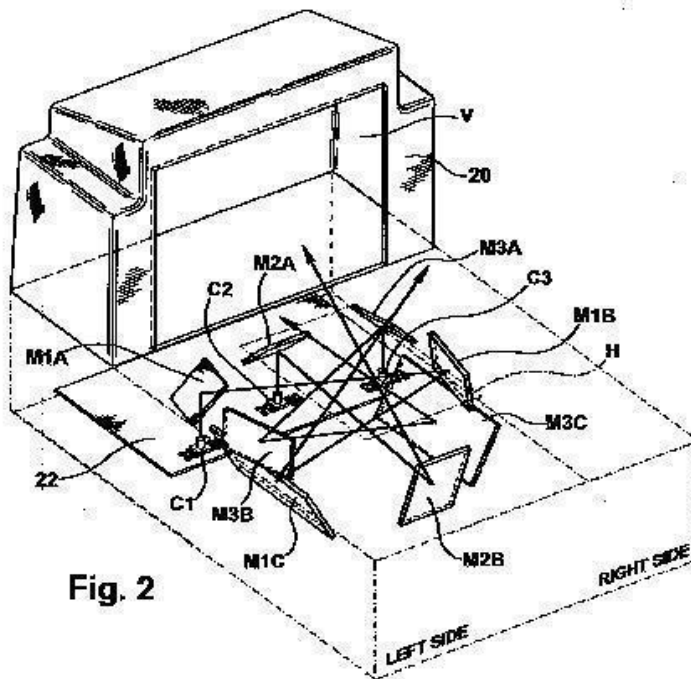
## G06K 7/10544

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

### Definition statement

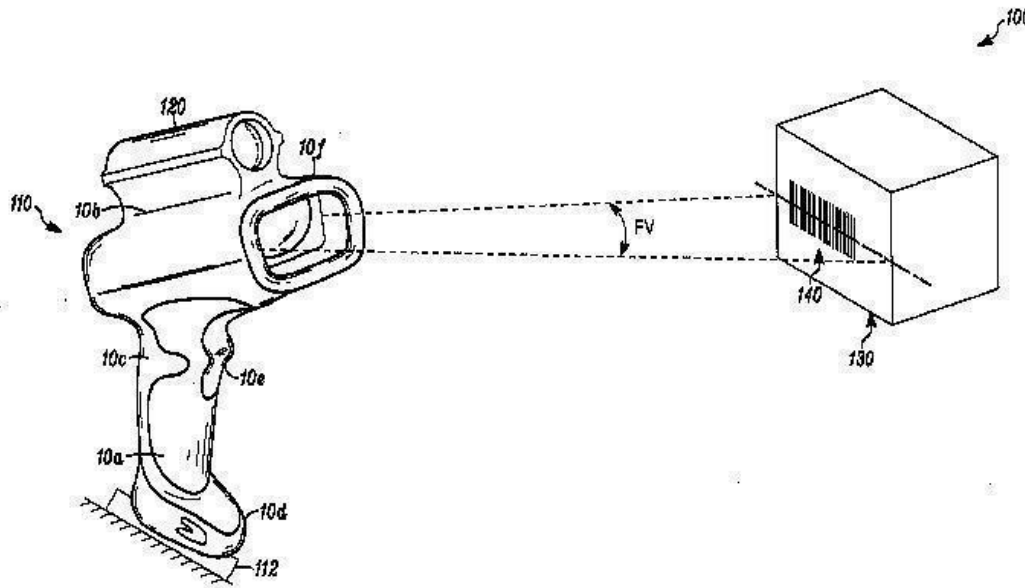
*This place covers:*

[G06K 7/10544](#) is reserved mainly for barcode reader systems, e.g. construction of the typical checkout counter multi-window systems:



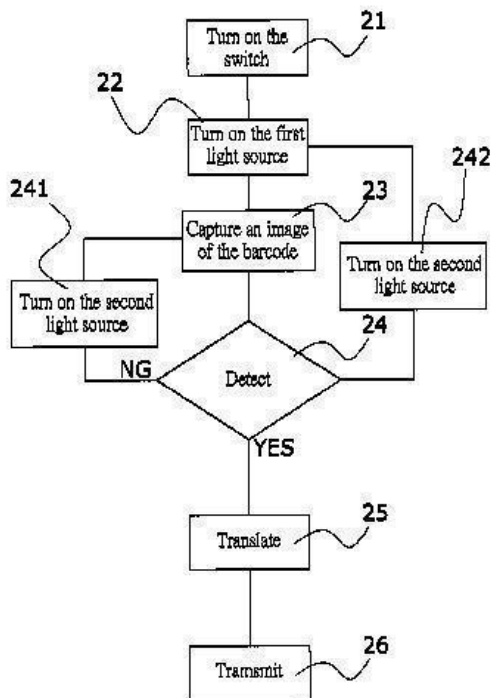
**G06K 7/10881****{constructional details of hand-held scanners}****Definition statement***This place covers:*

Details of handheld barcode readers are to be classified herein.

**FIG. 1****G06K 7/12****using a selected wavelength, e.g. to sense red marks and ignore blue marks****Definition statement***This place covers:*

Optical code readers, such as barcode readers, with special adaptations for reading barcodes in a selected predetermined wavelength range, e.g. barcode readers particularly adapted for colour

barcodes or barcode readers for barcodes that are invisible under regular illumination conditions but become visible when illuminated by a special light source, such as UV light:



### Relationships with other classification places

This is related to the Indexing Code [G06K 2019/06225](#) where color and other wavelength specific optical codes are classified.

### Special rules of classification

Bar code and optical code readers adapted for reading and illuminating targets that emit specific wavelengths, e.g. fluorescent targets, invisible targets only visible in infrared or UV.

### Synonyms and Keywords

*In patent documents the following words are often use:*

Infrared, UV, ultraviolet, fluorescence, color.

### G06K 7/14

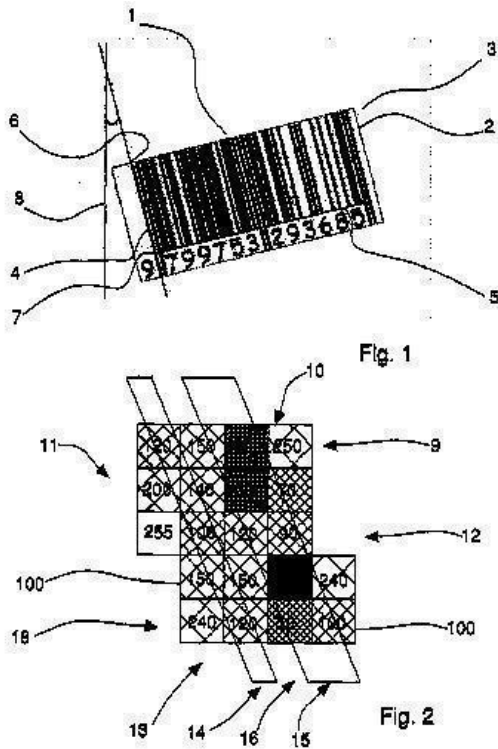
**using light without selection of wavelength, e.g. sensing reflected white light**  
 {([G06K 7/10831](#) - [G06K 7/1097](#) take precedence)}

### Definition statement

*This place covers:*

Barcode decoding methods and algorithms that are applied after the raw barcode material, such as the 2D image of a barcode, resides in the memory of a computer system. For example this groups covers algorithms that are applied after the image of the barcode has been taken by a CCD or CMOS

based imager and the image is in the memory of a computer system and can be subjected to image processing techniques for retrieving, correcting and decoding the bar code in the image.



### Special rules of classification

Algorithms for decoding bar codes should be classified here, in addition to methods for detecting bar codes, for error correction of bar code images imaged by a CCD camera.

### G06K 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](#) {; 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](#)})

### Definition statement

*This place covers:*

The initial (IPC 1) scope of [G06K 9/00](#) was:

"Methods or arrangements for reading or recognising printed or written characters or geometric figures" (OCR). From IPC 3 on, it also covers methods and arrangements for "recognising patterns" in general.

Recognising patterns means the labelling (categorisation, classification, identification) of a pattern, being measured data representing an object, with a meaningful label, based on the measured data from the object. It can also concern the detection of predetermined classes of patterns. The recognition function has tolerance to variability of objects within a class. The label is meaningful in the



sense that it represents a group of objects which share common properties or features. The label can be one of multiple labels (e.g. OCR) or binary (e.g. authentication).

Methods or systems for recognising patterns include the following functions:

- Acquisition of the pattern measurements, typically image acquisition. Acquisition includes stripping measured data not "belonging" to the pattern to be identified.
- (optional): pre-processing of the measurements, which should reduce the raw acquired / measured data. Determining / measuring features of the pattern (e.g. components in a spectral transformation) is a typical pre-processing for pattern recognition, but also size normalisation, binarisation, etc can be involved.
- decision on a class involving comparison with reference information.

[G06K 9/00](#) covers all of the above functions as far as essentially related to pattern recognition based on images (also sequences of coordinates, e.g. gestures or handwriting, as these can be used to generate an image). The essential relationship usually concerns the explicit use of acquisition or pre-processing functions for recognising patterns, but could also be an inherent or implicit relationship, e.g. feature extraction of the iris of an eye.

[G06K 9/00](#) further covers image feature extraction in general.

[G06K 9/00](#) further covers the actual recognition (classification; decision making) processes that can be applied irrespective of the nature of the patterns (objects) or measured data, e.g. classification/ discriminant methods. Also clustering and Blind Source Separation are covered.

[G06K 9/00](#) further covers the recognition of patterns in (one dimensional) signals, as far as the processing is of general applicability, i.e. not specific to the nature of the signal (e.g. not cardiac or seismic patterns).

The structure of the classification scheme comprises 4 main branches.

[G06K 9/00006](#) ... [G06K 9/00852](#): specific applications, where the nature of the above listed functions is specific for those applications (e.g. fingerprint, face, video).

[G06K 9/20](#): image acquisition.

[G06K 9/36](#): image preprocessing.

[G06K 9/62](#): matching and classification using electronic means and further.

[G06K 9/00973](#), [G06K 9/00993](#) electronic hardware and software implementations; management of recognition tasks.

[G06K 9/58](#), [G06K 9/74](#), [G06K 9/76](#) and [G06K 9/82](#): optical hardware arrangements (holograms etc.).

[G06K 9/03](#) error detection and correction.

### Relationships with other classification places

As functions originally provided in [G06K 9/00](#) are less and less implemented on dedicated hardware but on general purpose computers (PC) instead, new related groups have been created outside [G06K 9/00](#).

The most important of these is [G06T 7/00](#): Image analysis. Most of [G06K 9/00](#) deals with recognition based on images of objects, this part would logically be a subset of image analysis, [G06T 7/00](#).

When no semantic label is obtained by the image analysis or processing, but rather some other information (position, size, motion vector, etc.), classes in [G06T 7/00](#) apply.

Functions traditionally associated with pattern recognition can also be used for image analysis, enhancement or other transformations. When not essentially related to a recognition, classes in

[G06T](#) (mostly [G06T 3/00](#), [G06T 5/00](#) and [G06T 7/00](#)) should apply. The particular relationships and exceptions to general rules will be treated below for the particular classes concerning such specific functions.

## References

### Limiting references

*This place does not cover:*

|   |   |
|---|---|
| Reading and decoding (bar) codes  | <a href="#">G06K 7/00</a> ; <a href="#">G06K 19/00</a>  |
| Detecting, measuring, and recording for medical diagnostic purposes   | <a href="#">A61B 5/00</a>                               |
| Identifications of persons by non automated means (e.g. latent fingerprint development)                       | <a href="#">A61B 5/117</a>                              |
| Recognising patterns from RADAR signals   | <a href="#">G01S</a>                                    |
| Geophysics  | <a href="#">G01V</a>                                    |
| Recognition or classification of text   | <a href="#">G06F 17/20</a> ; <a href="#">G06F 16/00</a> |
| Neural networks not specially adapted for pattern recognition   | <a href="#">G06N</a>                                    |
| Processing images not necessarily for purpose or recognition  | <a href="#">G06T 3/00</a> ; <a href="#">G06T 5/00</a>   |
| Feature extraction in relation to other image analysis than pattern recognition and image analysis in general | <a href="#">G06T 7/00</a>                               |
| Industrial and biomedical image inspection  | <a href="#">G06T 7/0002</a>                             |
| Speech and voice recognition  | <a href="#">G10L</a>                                    |

### Application-oriented references

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

The mere use of known pattern recognition techniques for particular applications should be classified in the appropriate technical field (application place) when provided, optionally with an Indexing Code in [G06K 9/00](#) as additional information. These are referred to in the appropriate group definitions and in the below table:

|   |                               |
|---|-------------------------------|
| Postal sorting  | <a href="#">B07C 3/10</a>     |
| Content based data retrieval  | <a href="#">G06F 16/00</a>    |
| Security arrangements for protecting computer systems against unauthorised activity | <a href="#">G06F 21/00</a>    |
| Identity verification in commercial transactions                                    | <a href="#">G06Q</a>          |
| Access control based on biometrics  | <a href="#">G07C 9/00007</a>  |
| Recognising banknotes   | <a href="#">G07D 7/00</a>     |
| Burglar, theft or intruder alarm  | <a href="#">G08B 13/196</a>   |
| Arrangements for computer network security  | <a href="#">H04L 29/06551</a> |
| Image compression involving recognition of patterns in the image                    | <a href="#">H04N 1/4115</a>   |

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|                        |                      |
|------------------------|----------------------|
| Healthcare informatics | <a href="#">G16H</a> |
|------------------------|----------------------|

## Special rules of classification

Generally speaking, function-related groups should be used except when application-specific processing details are disclosed, i.e. it would not be obvious to use the same process for another application, e.g. fingerprint scanners normally cannot be used to scan documents. In that case, application-related groups will be used in the first place.

If an application does not require specially adapted processing, an application group should not be used. The type of application becomes additional information can be indicated by a corresponding Indexing Code.

[G06K 9/60](#), [G06K 9/78](#) and [G06K 9/80](#): Combination of functions from acquisition, preprocessing and/or matching/ classification. Other combination groups are [G06K 9/54](#) and [G06K 9/56](#) and [G06K 9/82](#). Only combinations of functionally related concepts should be classified in combination groups, e.g. feedback from recognition scores to preprocessing function or a particular sequence of partially non-linear processes.

## G06K 9/00013

{Image acquisition (materials for developing fingerprints, means for visual identification [A61B 5/1172](#))}

### References

#### Limiting references

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Powders, films and other products for developing latent prints | <a href="#">A61B 5/1172</a> |
|--|-----------------------------|

## G06K 9/00046

{by using geometrical optics, e.g. using prisms ([G06K 9/00033](#) takes precedence)}

### Definition statement

*This place covers:*

Sensors where a finger contacts an optical element, e.g. a prism and where the image creation is based on different behaviour (reflection) of light where skin does resp. does not touch the optical element.

## G06K 9/00087

{Matching; Classification}

### Definition statement

*This place covers:*

Aligning fingerprint patterns or features; Matching criteria;

Classifying fingerprint as match resp. no match to a reference fingerprint.

## References

### Limiting references

*This place does not cover:*

|   |                              |
|---|------------------------------|
| Classification of the type of the fingerprint | <a href="#">G06K 9/0008</a>  |
| Matching consecutive images to detect spoofs  | <a href="#">G06K 9/00107</a> |

## G06K 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](#))}

### Definition statement

*This place covers:*

Classifying or recognising biological material or microscopic objects based on shape or pattern;

Acquisition as far as having a relation with an image analysis process.

## References

### Limiting references

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Apparatus for measuring microbiological properties   | <a href="#">C12M 1/34</a>   |
| Optical analysis of chemical or physical properties of particles, e.g. investigation of dimensions | <a href="#">G01N 15/14</a>  |
| Biomedical image inspection  | <a href="#">G06T 7/0012</a> |

## G06K 9/00154

{Reading or verifying signatures; Writer recognition}

### Definition statement

*This place covers:*

The recognition/ authentication of persons by their signature or handwriting; both scanned and dynamic.

**G06K 9/00496**

{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](#))}

**Definition statement**

*This place covers:*

Methods for analysis or recognition of patterns in signals not representing images, not specific to the nature or origin of the signal.

**References****Limiting references**

*This place does not cover:*

|  |   |
|--|---|
| Signature verification   | <a href="#">G06K 9/00154</a>                          |
| Analysing specific medical signals, e.g. bioelectric signals, blood pressure | <a href="#">A61B 5/00</a>                             |
| Analysis of chromatographic signals  | <a href="#">G01N 30/86</a>                            |
| Processing radar and similar signals <a href="#">G01S</a>                    | <a href="#">G01S</a>                                  |
| Processing seismic signals   | <a href="#">G01V 1/28</a> , <a href="#">G01V 1/46</a> |
| Acoustic speech processing   | <a href="#">G10L</a>                                  |
| Transmission systems   | <a href="#">H04B 1/00</a>                             |

**G06K 9/00852**

{Recognising whole cursive words}

**Definition statement**

*This place covers:*

Cursive handwriting, i.e. connected characters.

**References****Limiting references**

*This place does not cover:*

|                                 |   |
|---------------------------------|---|
| Recognition of "online" writing | <a href="#">G06K 9/00402</a> ,<br><a href="#">G06K 9/22</a> |
|---------------------------------|---|

## G06K 9/20

### Image acquisition

#### Definition statement

*This place covers:*

All processes resulting in isolating and preparing the part of a signal corresponding to the pattern to be recognised, without discarding any measured signal content belonging to the pattern.

#### References

##### Limiting references

*This place does not cover:*

|                                      |                           |
|--------------------------------------|---------------------------|
| Tablets, coordinate inputting stylus | <a href="#">G06F 3/00</a> |
| Scanners, cameras                    | <a href="#">H04N</a>      |

## G06K 9/2009

### {Construction of image pick-up using regular bi-dimensional dissection}

#### Definition statement

*This place covers:*

Scanning resulting in a two dimensional bitmap, as opposed to e.g. flying spot scanners. Only as far as essentially related to the recognition process.

## G06K 9/28

### using discrete sensing elements at predetermined points

#### Definition statement

*This place covers:*

Using discrete sensing elements positioned at predetermined locations but not forming a regular grid pattern.

## G06K 9/32

### Aligning or centering of the image pick-up or image-field

#### Definition statement

*This place covers:*

In Optical Character Recognition this means the normalisation of the position and /or orientation of the character image, e.g. based on centre of gravity, estimated baseline, etc. (not by matching with reference information). In general, the alignment or centering has a relationship with a reference position for which the reference information (template or other model) was obtained.

#### References

##### Limiting references

*This place does not cover:*

|  |                           |
|--|---------------------------|
| Image analysis for determining position of objects | <a href="#">G06T 7/70</a> |
|--|---------------------------|

|                    |                           |
|--------------------|---------------------------|
| Camera calibration | <a href="#">G06T 7/80</a> |
|--------------------|---------------------------|

## G06K 9/3208

{Orientation detection or correction, e.g. rotation of multiples of 90 degrees}

### References

#### Limiting references

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| For inclination angles requiring a smaller correction than 90° | <a href="#">G06K 9/3275</a> |
|--|-----------------------------|

## G06K 9/3233

{Determination of region of interest (segmentation for general image processing [G06T 7/10](#))}

### Definition statement

*This place covers:*

The region of interest potentially containing patterns to be recognised.

## G06K 9/3275

{Inclination (skew) detection or correction of characters or of image to be recognised (determining orientation of objects in general [G06T 7/70](#))}

### References

#### Limiting references

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| Rotations of 90°, 180° and mirroring:         | <a href="#">G06K 9/3208</a> |
| Determining orientation of objects in general | <a href="#">G06T 7/70</a>   |

## G06K 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](#))}

### Definition statement

*This place covers:*

In Optical Character Recognition this means the cutting out of characters from neighbouring or touching objects. Could also apply to other touching or overlapping objects, e.g. industrial parts or cell in a microscope slide.

## References

### Limiting references

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| Segmentation by quantisation, e.g. thresholding,            | <a href="#">G06K 9/38</a>   |
| Edge detection for image feature extraction                 | <a href="#">G06K 9/4604</a> |
| Extraction of connected components or edge linking          | <a href="#">G06K 9/4638</a> |
| Segmentation or edge detection for general image processing | <a href="#">G06T 7/10</a>   |

## G06K 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](#))**

### Definition statement

*This place covers:*

All processes which reduce the raw acquired data belonging to the pattern to be recognised, with the aim of separating distinguishing information from relatively uninformative data, e.g., in OCR the outer shape or stroke pattern are more relevant for the character identity than the stroke thickness or character size.

## References

### Limiting references

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| Selecting subset of features                             | <a href="#">G06K 9/6228</a> |
| Extracting features by operating on the feature space:   | <a href="#">G06K 9/6232</a> |
| Image processing not essentially for pattern recognition | <a href="#">G06T</a>        |

## G06K 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](#))}**

## References

### Limiting references

*This place does not cover:*

|   |                            |
|---|----------------------------|
| Region-based segmentation of touching or overlapping patterns | <a href="#">G06K 9/342</a> |
| Image segmentation as such                                    | <a href="#">G06T 7/10</a>  |



## G06K 9/40

Noise filtering {(restoration for general image processing [G06T 5/001](#); morphologic operations for general image enhancement [G06T 5/30](#))}

### Definition statement

*This place covers:*

Noise filtering only if essentially related to recognition.

## G06K 9/42

Normalisation of the pattern dimensions

### References

#### Limiting references

*This place does not cover:*

|                   |                           |
|-------------------|---------------------------|
| Scaling of images | <a href="#">G06T 3/40</a> |
|-------------------|---------------------------|

## G06K 9/44

Smoothing or thinning of the pattern {(restoration for general image processing [G06T 5/001](#); morphologic operations for general image enhancement [G06T 5/30](#))}

### Definition statement

*This place covers:*

Thinning in the sense of reducing the pattern to the essential information, e.g. as a preprocessing step to find characteristic points of a skeleton pattern. Smoothing in the sense of separating of relevant from irrelevant shape features.

### References

#### Limiting references

*This place does not cover:*

|  |                            |
|--|----------------------------|
| Smoothing for general image processing               | <a href="#">G06T 5/001</a> |
| Morphologic operations for general image enhancement | <a href="#">G06T 5/30</a>  |

## G06K 9/46

Extraction of features or characteristics of the image {(segmentation of touching or overlapping patterns [G06K 9/34](#); edge detection for feature extraction [G06K 9/4604](#); segmentation or edge detection for general image processing [G06T 7/10](#))}

### Definition statement

*This place covers:*

Measurements on patterns or detection of components of patterns essentially suitable for recognising the patterns.

## References

### Limiting references

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| Segmentation of touching or overlapping patterns            | <a href="#">G06K 9/34</a>   |
| Edge detection for feature extraction                       | <a href="#">G06K 9/4604</a> |
| Segmentation or edge detection for general image processing | <a href="#">G06T 7/10</a>   |

## G06K 9/4642

**{by performing operations within image blocks or by using histograms (G06K 9/4652 and G06K 9/4671 take precedence; matching image histograms G06K 9/6212)}**

### Definition statement

*This place covers:*

Histograms also in the meaning of counts of foreground pixels, e.g. in columns for an x-axis histogram.

## References

### Limiting references

*This place does not cover:*

|                           |                             |
|---------------------------|-----------------------------|
| Matching image histograms | <a href="#">G06K 9/6212</a> |
|---------------------------|-----------------------------|

## G06K 9/482

**{analysing the spectrum of the contour, e.g. Fourier expansion}**

### Glossary of terms

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

In Fourier expansion, the coordinates of ordered points of a closed contour (x,y) are considered as complex numbers  $x+j.y$ , which can be considered as a repetitive one-dimensional sequence, which can be analysed with Fourier transform.

## G06K 11/00

**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](#))**

### Special rules of classification

This group and its groups are no longer used for the classification of new documents as from 1 January 2006. Documents relating to methods and arrangements for input to a computer are classified under [G06F 3/033](#) and [G06F 3/041](#).

Before 1 January 2006, groups [G06K 11/00](#) - [G06K 11/06](#) were already not used because of obsolescence, whereas other groups under [G06K 11/06](#), deleted in 2006, were used to classify constructional details of computer pointing devices now classified under [G06F 3/033](#) and digitizers technologies now classified under [G06F 3/041](#).

## G06K 13/00

**Conveying record carriers from one station to another, e.g. from stack to punching mechanism (transport devices in general [B65G](#); handling thin or filamentary material in general [B65H](#))**

### Definition statement

*This place covers:*

Arrangements for moving data carriers, such as smart cards, into and out of a data carrier reader device

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

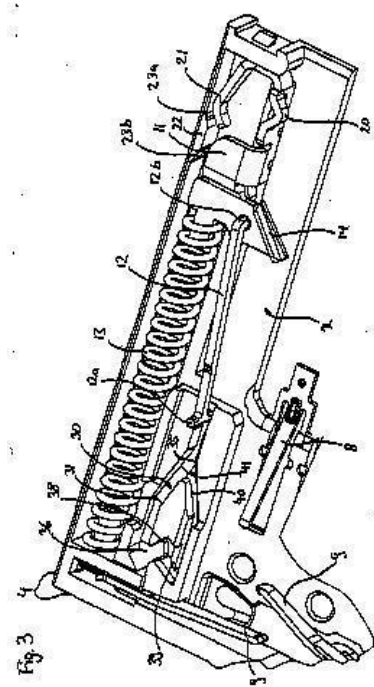
|   |                      |
|---|----------------------|
| Handling of coins or of paper currency of similar valuable papers | <a href="#">G07D</a> |
|---|----------------------|

### Special rules of classification

[G06K 13/06](#) is for classification of mechanisms that assist in correct guiding of the card in the card reader

[G06K 13/08](#) is for classification of aspects for inserting and ejection of cards into and out from card readers.

[G06K 13/08](#) contains in particular the arrangements for inserting and ejection of cards, like card ejectors using a spring and a heart shaped cam to arrive at a push-push card insertion-ejection arrangement.



## G06K 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](#) {; construction of printing heads [B41J 2/00](#); special arrangements for scanning and reproduction of pictures involving their transmission, e.g. facsimile [H04N 1/00](#); for photocomposing [B41B 19/00](#)})

### Definition statement

*This place covers:*

Digital data processing in printers and related to the printing of computer output data.

Control of digital printing means, not otherwise provided for.

### Relationships with other classification places

|                                |                           |
|--------------------------------|---------------------------|
| Printing as such is covered by | <a href="#">B41</a>       |
| Printer drivers                | <a href="#">G06F 3/12</a> |
| Image processing               | <a href="#">G06T</a>      |

## References

### Limiting references

*This place does not cover:*

|   |                             |
|---|-----------------------------|
| Photocomposing  | <a href="#">B41B 19/00</a>  |
| Construction of print heads   | <a href="#">B41J 2/00</a>   |
| Control and analysis of mechanical parameters involving printing test patterns              | <a href="#">B41J 29/393</a> |
| Light beam scanning systems using movable or deformable optical elements                    | <a href="#">G02B 26/10</a>  |
| Digital data processing in computers and related to printing                                | <a href="#">G06F 3/12</a>   |
| Two-dimensional image generation  | <a href="#">G06T 11/00</a>  |
| Special arrangements for scanning and reproduction of pictures, e.g. photographs, facsimile | <a href="#">H04N 1/00</a>   |

## Glossary of terms

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

|               |                                     |
|---------------|-------------------------------------|
| To rip (verb) | to generate a pixel map of an image |
|---------------|-------------------------------------|

## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

|     |                           |
|-----|---------------------------|
| PDL | Page Description Language |
| RIP | Raster Image Processing   |

## G06K 17/00

**Methods or arrangements for effecting co-operative working between equipments covered by two or more of the preceding main groups, e.g. automatic card files incorporating conveying and reading operations**

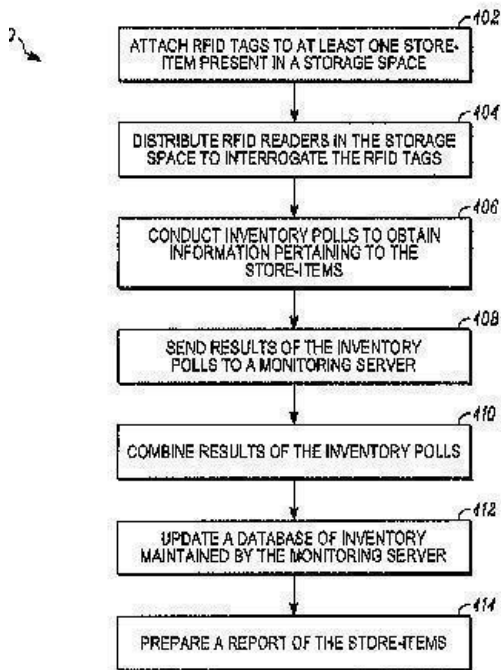
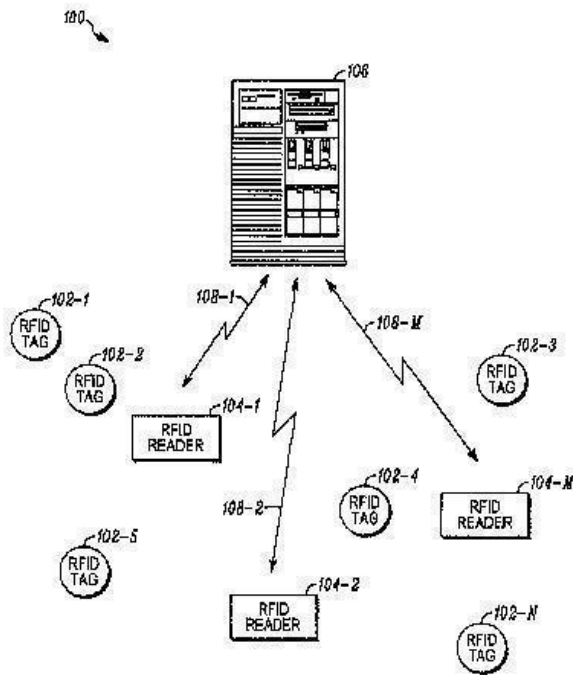
### Definition statement

*This place covers:*

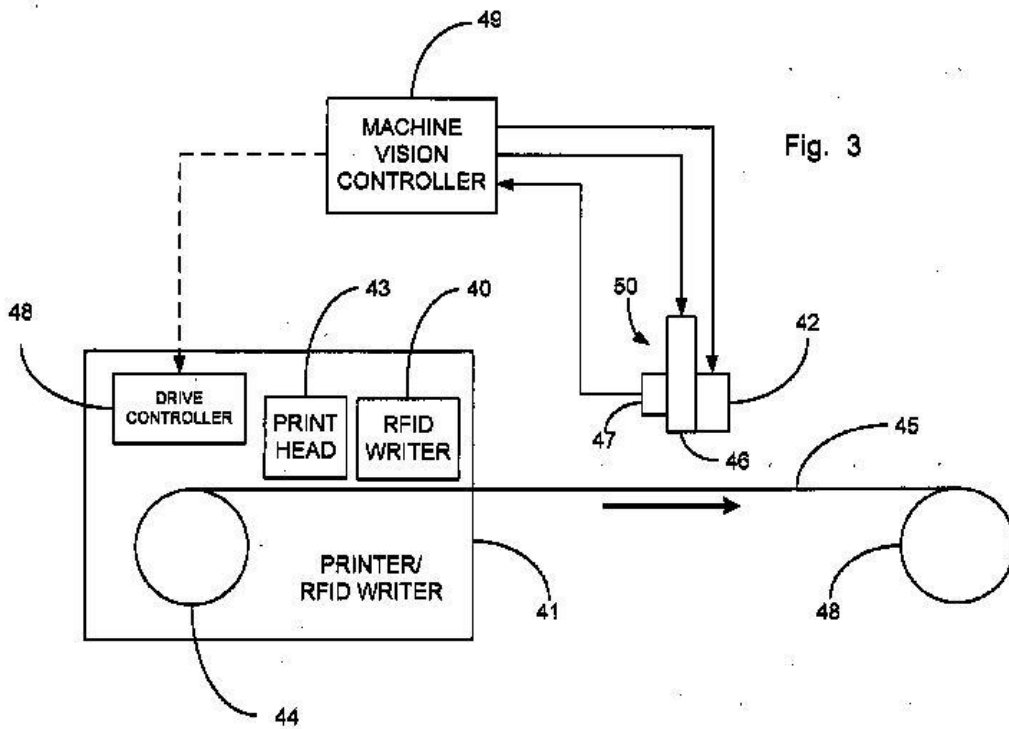
- Methods or arrangements for effecting co-operative working between equipments covered by two or more of the preceding main groups, e.g. automatic card files incorporating conveying and reading operations.
- Methods or systems involving reading and writing of identification or authentication codes on record carriers, or reading of codes and transporting of carriers.

Further classification information:

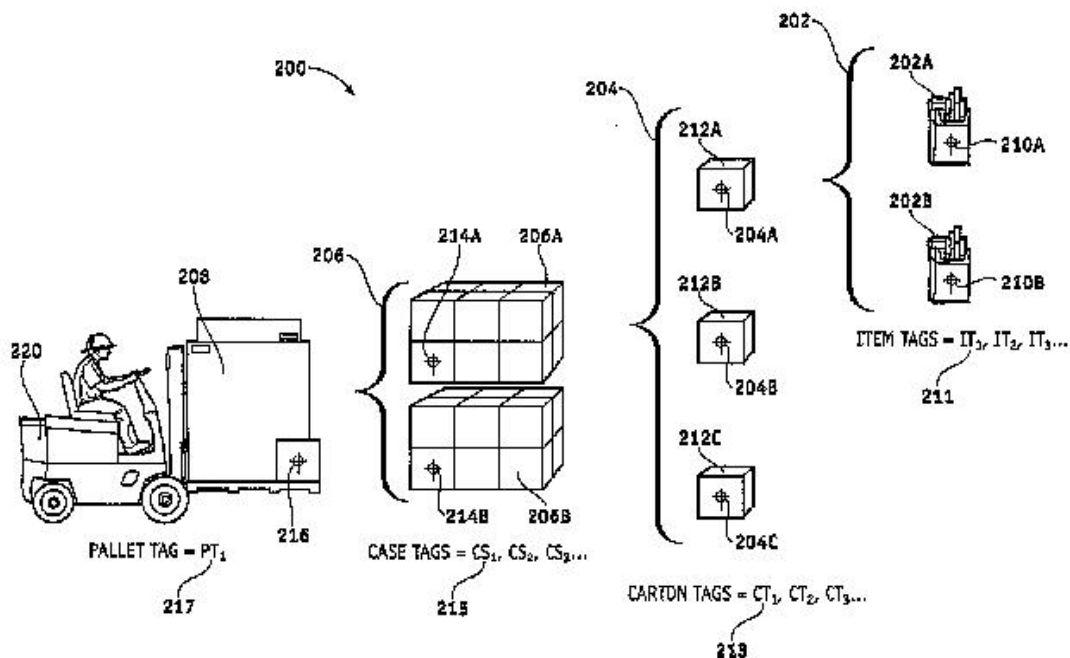
G06K 17/022 contains inventory control systems:



[G06K 17/0025](#) covers combined RFID - printing systems, like the typical RFID label writers:



[G06K 17/0029](#) covers arrangements to deal with grouped articles with each article having an identifier:



**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|                          |                            |
|--------------------------|----------------------------|
| Correctness verification | <a href="#">G06K 5/02</a>  |
| Collecting milk          | <a href="#">A01K 11/00</a> |

|  |                                |
|--|--------------------------------|
| Medical systems in general   | <a href="#">A61</a>            |
| Test tubes with identification means   | <a href="#">B01L 3/5453</a>    |
| Labelling machines using RFIDs   | <a href="#">B65C 2009/0003</a> |
| Collecting waste   | <a href="#">B65F 1/00</a>      |
| Logistics using RFIDs or barcodes  | <a href="#">G06Q 10/08</a>     |
| Inventory control using RFIDs or barcodes  | <a href="#">G06Q 10/08</a>     |
| Access-control involving the use of a pass, e.g. tag, transponder  | <a href="#">G07C 9/00007</a>   |
| Personalization of a card  | <a href="#">G07F 7/1008</a>    |
| Theft detection systems using tags   | <a href="#">G08B 13/2402</a>   |
| ICT specially adapted for the handling or processing of patient-related medical or healthcare data stored on portable record carriers, e.g. on smartcards, RFID tags or CD | <a href="#">G16H 10/65</a>     |

### Special rules of classification

The particular use of a record carrier, if of importance to the invention, should be classified in the corresponding [G06K 17/00](#) groups.

Examples of such uses are:

[G06K 17/0025](#) covers devices combining in a single entity printing and RFID writing.

[G06K 17/0029](#) covers arrangements for interrogating grouped objects carrying identifiers, such as a carton with an RFID containing multiple cigarette packages each having an RFID.

[G06K 17/00](#) is used for classification of arrangements and methods where a plurality of objects is tagged with an identifier and some logistic process is carried out using the arrangement. Further classification is made in [G06Q](#), particularly if the technical effect of the identifiers that are used is common knowledge.

## G06K 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](#))**

### Definition statement

*This place covers:*

In this main group primarily hand holdable devices or artifacts are classified that contain at least one digital marking, such as RFIDs, smart cards, magnetic stripe cards, barcodes, optical codes, and non-intelligent resonating digital marks without.

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

|  |                            |
|--|----------------------------|
| Arrangements on smart cards for sensing fingerprints                     | <a href="#">G06K 9/20</a>  |
| Plastic moulding techniques for card shaped objects, such as smart cards | <a href="#">B29C 45/14</a> |



|   |                            |
|---|----------------------------|
| Lamination suitable for card shaped articles  | <a href="#">B32B 37/00</a> |
| Printing or marking of cards not characterised by the kind of marking                         | <a href="#">B42D 15/00</a> |
| Operating system software for smart cards   | <a href="#">G06F 9/44</a>  |
| Data input/out arrangements, such as buses, to transfer data from/to smart cards              | <a href="#">G06F 13/38</a> |
| General arrangements for computer security  | <a href="#">G06F 21/00</a> |
| Cards for automatic access control systems  | <a href="#">G07C 9/00</a>  |
| Record carriers made e.g. of paper or other flexible material, suitable for use as a banknote | <a href="#">G07D 7/00</a>  |
| Smart cards for payment   | <a href="#">G07F 7/00</a>  |
| Anti-theft arrangements using RFIDs   | <a href="#">G08B 13/24</a> |
| Labels for tamper secure fixing to objects  | <a href="#">G09F 3/03</a>  |
| Recording by magnetisation or demagnetisation of a record carrier                             | <a href="#">G11B 5/00</a>  |
| Details of memory layout in smart cards   | <a href="#">G11C 5/00</a>  |
| Manufacturing of the integrated circuit in a smart card                                       | <a href="#">H01L 23/00</a> |
| Security software for smart cards and RFIDs using encryption                                  | <a href="#">H04L 9/00</a>  |
| Manufacturing of printed circuits on a smart card   | <a href="#">H05K 3/00</a>  |

### Special rules of classification

Amongst the various groups under [G06K 19/00](#), the following groups are the most important, in particular in that these groups are most frequently used:

|  |                               |
|--|-------------------------------|
| Constructional details of optical codes, such as barcodes                                | <a href="#">G06K 19/06009</a> |
| Magnetic stripes as used on e.g. credit cards.   | <a href="#">G06K 19/06187</a> |
| Functionality of contact based smart cards   | <a href="#">G06K 19/07</a>    |
| Arrangements for protection the integrated circuit in smart card against intrusion       | <a href="#">G06K 19/073</a>   |
| Constructional details for non-contact smart cards, RFIDs, transponders or wireless tags | <a href="#">G06K 19/07749</a> |
| Functionality of non-contact smart cards, RFIDs, transponders or wireless tags           | <a href="#">G06K 19/0723</a>  |
| Constructional details for contact-based smart cards                                     | <a href="#">G06K 19/077</a>   |

## G06K 19/02

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

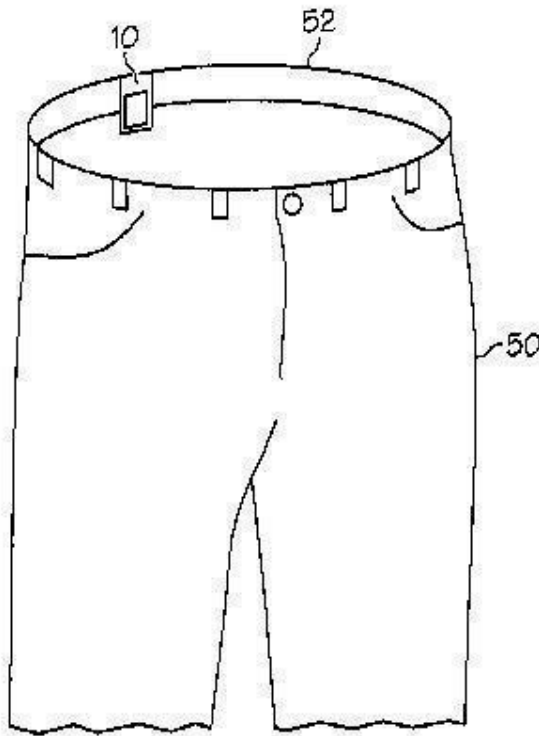
### Definition statement

*This place covers:*

The selected material of the record carrier achieves an extra effect which is not directly related to the function as record carrier.

Examples:

- record carrier made of a material that withstands gastric acids so that it may be brought in the stomach of cattle, or
- a tag with special adaptations to the material to attach it to a garment, like



or a metal data carrier



Counterexample:

bar code printed in a colour material only visible under UV light: [G06K 19/06046](#).

## G06K 19/04

characterised by the shape

### Definition statement

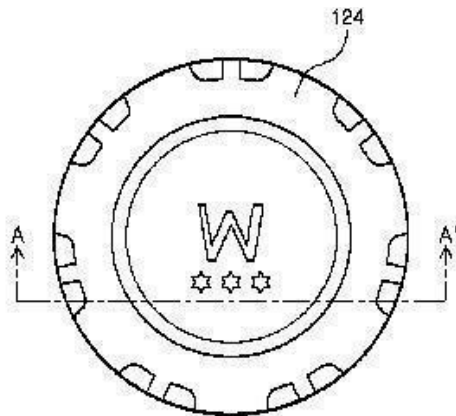
*This place covers:*

Different peculiar form factors.

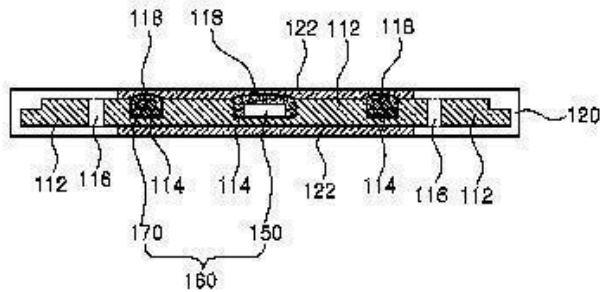
Examples:

- circular RFID tag to be attached to a DVD
- identification wrist band for newborn babies in hospitals

- credit card with a non-standard shape (e.g. one rounded corner as a marketing gag)
- casino chips with RFID



[Fig. 2]



## G06K 19/06009

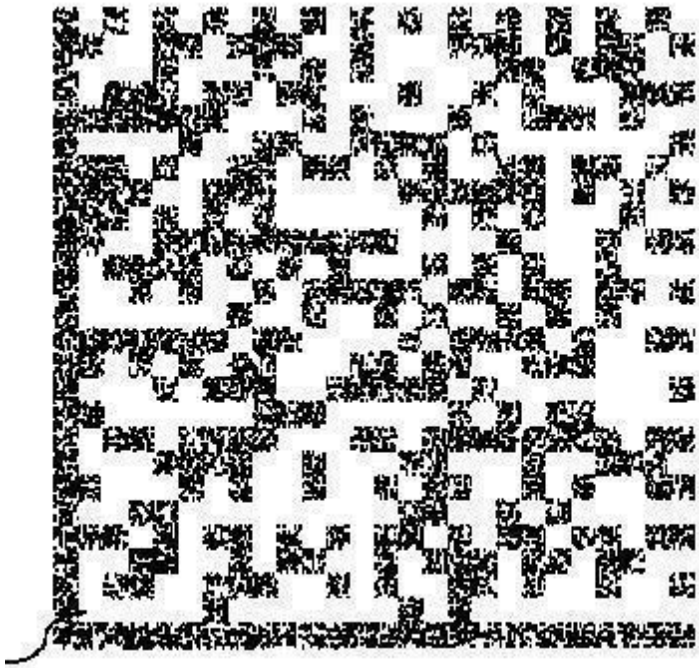
{with optically detectable marking ([G06K 19/063](#), [G06K 19/08](#) take precedence)}

### Definition statement

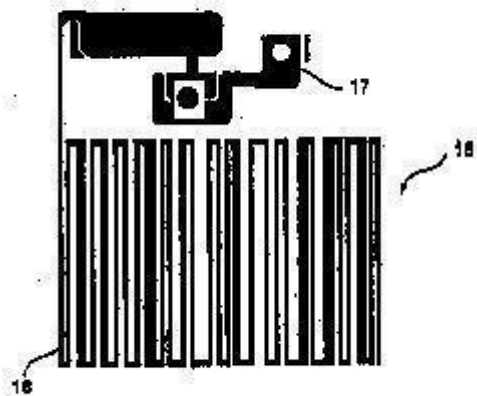
*This place covers:*

Examples:

- label coding data by spectral signatures
- using characters having small modifications to code digital data in a text
- printed data code
- barcodes like a 2D barcode where each barcode pixel is a barcode itself:



but also barcodes where the barcode is at the same time an antenna of an RFID like device (needs also a classification in [G06K 19/07749](#)):



### Special rules of classification

|   |                                 |
|---|---------------------------------|
| Holographic, diffractive or retroreflective recording | <a href="#">G06K 2019/0629</a>  |
| Wavelength selection                                  | <a href="#">G06K 2019/06225</a> |
| Miniature code  | <a href="#">G06K 2019/06234</a> |

**G06K 19/06018****{one-dimensional coding}****Definition statement***This place covers:*

Digital optical markings arranged in one dimension in space, such as the well known 1D barcodes

**G06K 19/06037****{multi-dimensional coding}****Definition statement***This place covers:*

Markings arranged in more than one dimension in space.

Examples: Code 49, DataMatrix, MaxiCode, PDF 471.

**G06K 19/06046****{Constructional details}****Definition statement***This place covers:*

Constructional details of optically detectable markings (e.g. kind of material or physical properties).

Example: encoded optical identification elements including an optical substrate having a diffraction grating with refractive index variations (e.g. WO2005027031).

**Special rules of classification**

See [G06K 19/08](#) and lower if there is a combined effect with an other type of code.

**G06K 19/06187****{with magnetically detectable marking}****Definition statement***This place covers:*

The marking codes at least one bit (e.g. present/not present), data carriers for magnetically detectable purely analog "signatures" or signals should not be classified here.

Examples:

- classical banking/credit card with a magnetic stripe;
- bar codes printed with magnetic ink;
- security tags comprising magnetic elements coding digital information (security tags per se: see [G08B](#)).

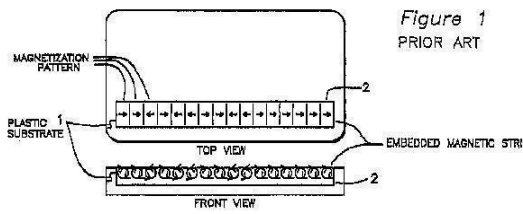


Figure 1  
PRIOR ART

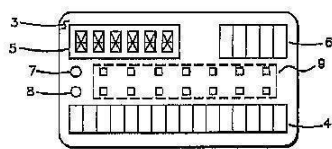


Figure 2

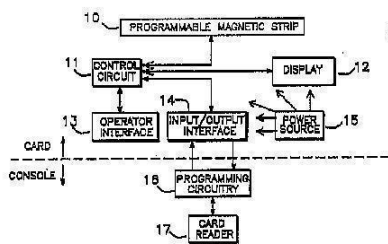


Figure 3

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

|   |                            |
|---|----------------------------|
| Magnetic theft detection tags   | <a href="#">G08B</a>       |
| Magnetic recording with relative movement between data carrier and transducer                   | <a href="#">G11B 5/00</a>  |
| Magnetic alloy thin films as used in magnetoresistive application in static memory applications | <a href="#">G11C 11/00</a> |

## G06K 19/06196

### {Constructional details}

#### Definition statement

This place covers:

Constructional details of the magnetically detectable markings (e.g. kind of material or physical properties).

#### Special rules of classification

Consider classifying in [G06K 19/08](#) and groups if there is a combined effect with another type of code.

**G06K 19/063**

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

**Definition statement**

*This place covers:*

For example:

- punched cards;
- credit card with Braille characters.

**References****Limiting references**

*This place does not cover:*

|                     |                                 |
|---------------------|---------------------------------|
| Relief-type marking | <a href="#">G06K 2019/06271</a> |
|---------------------|---------------------------------|

**G06K 19/067**

**Record carriers with conductive marks, printed circuits or semiconductor circuit elements, e.g. credit or identity cards {also with resonating or responding marks without active components}**

**Definition statement**

*This place covers:*

For example:

- bar codes printed with conductive ink;
- card comprising pencil markings to be sensed by their conductivity;
- cards carrying a passive LC circuit.

**G06K 19/0672**

**{with resonating marks}**

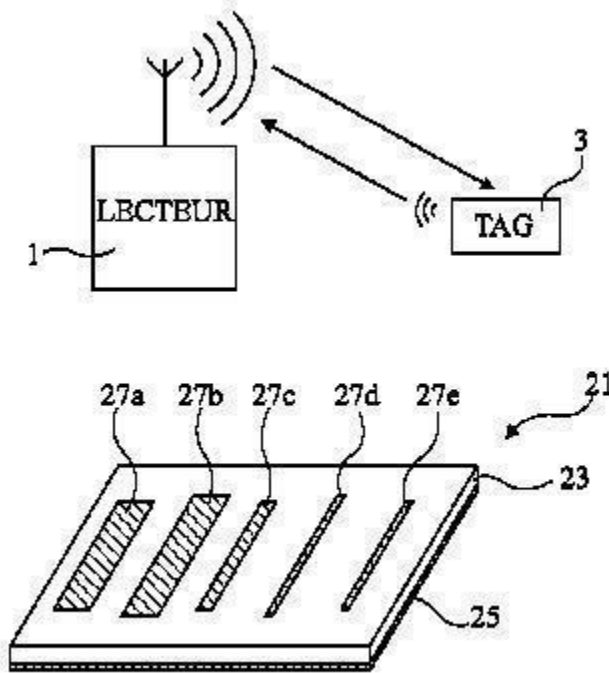
**Definition statement**

*This place covers:*

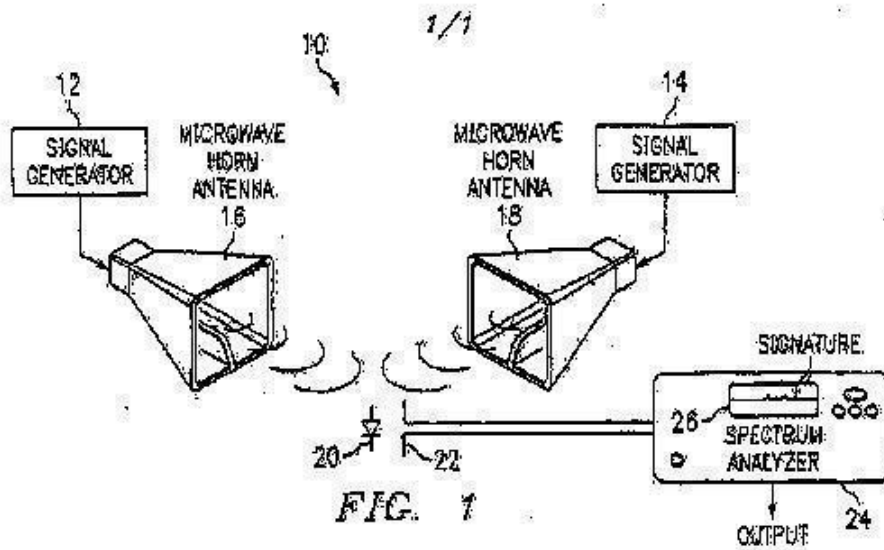
Record carriers that do not comprise a logical or integrated circuit and that reflect a digital code upon interrogation by an electromagnetic field.

Examples:

record carrier comprising a plurality of resonating LC circuits

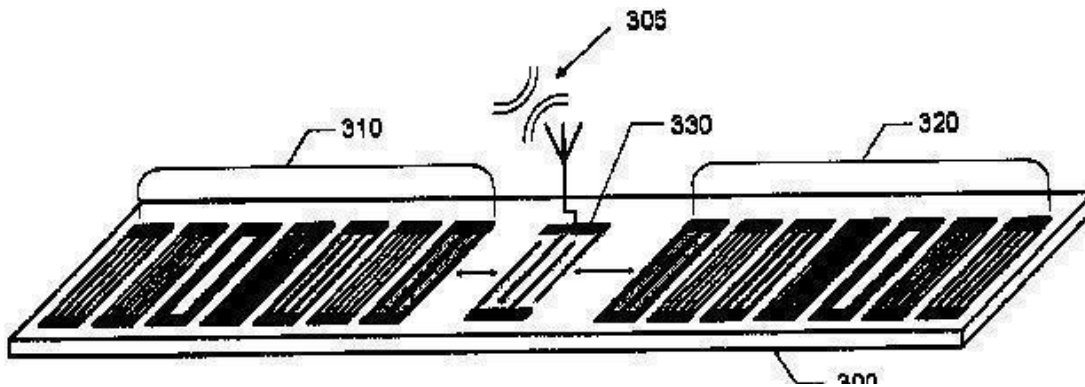


or e.g.





or surface acoustic wave (SAW) transponders



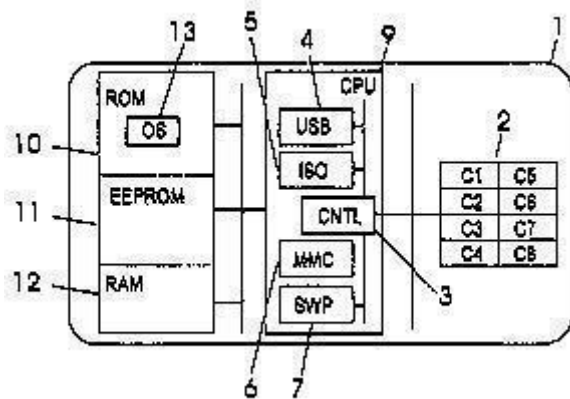
**G06K 19/07**

with integrated circuit chips

**Definition statement**

*This place covers:*

Data carriers, such as smart cards or RFID tags that comprise at least one integrated circuit.



**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                            |
|---|----------------------------|
| EEPROM memories                         | <a href="#">G11C 16/00</a> |
| Switched networks for telephone systems | <b>H04Q7/00</b>            |

## G06K 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 RFIDs}

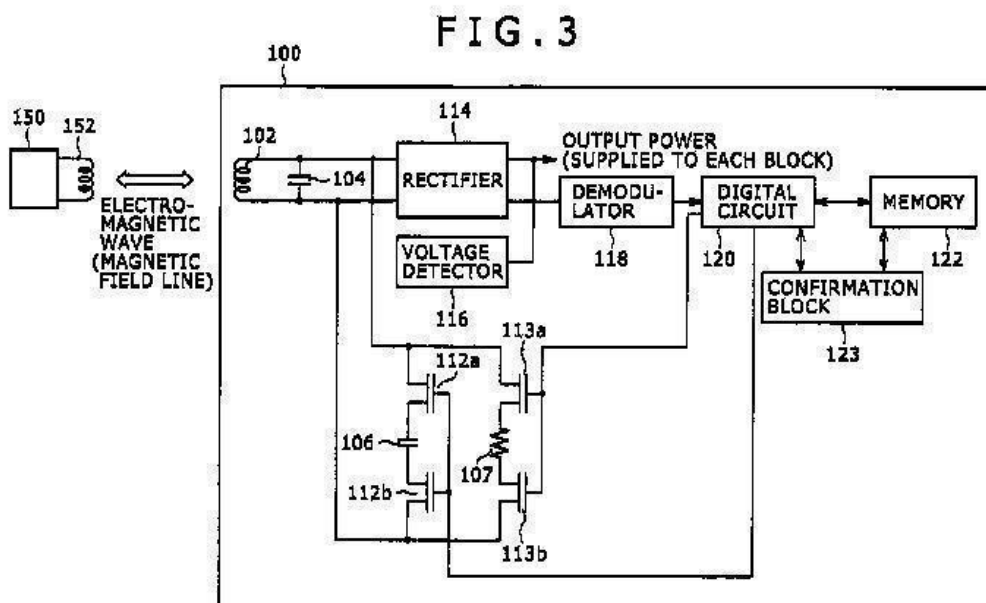
### Definition statement

*This place covers:*

data carriers with integrated circuits and with a wireless communication means.

Examples:

RFID tags and contactless chip cards (ISO 14443, 15693, 18000).



### References

#### Limiting references

*This place does not cover:*

|  |                             |
|--|-----------------------------|
| System using reflection of radio waves using passive responders radiating a codes signal | <a href="#">G01S 13/765</a> |
| System with exchange of information between initiator and responder                      | <a href="#">G01S 13/765</a> |
| Near-field transmission systems  | <a href="#">H04B 5/00</a>   |

**G06K 19/073**

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

**Definition statement**

*This place covers:*

In this group security related aspects realized by means on the card or the RFID device are found, e.g. arrangements to protect the circuits on a smart card against intrusion.

**References****Limiting references**

*This place does not cover:*

At least some of the measures for preventing access to the data in the integrated circuit should be hardware based, pure software solutions, e.g. encryption, should not be classified in [G06K](#). In these cases the classes of the related fields mentioned below should be considered.

|  |                            |
|--|----------------------------|
| Security arrangements in computer systems        | <a href="#">G06F 21/00</a> |
| Smart cards for payment                          | <a href="#">G07F 7/10</a>  |
| Secure smart card communication using encryption | <a href="#">H04L 9/00</a>  |

**G06K 19/07327**

**{Passive means, e.g. Faraday cages (Faraday-type protection of electric circuits in general [H05K 9/00](#))}**

**Definition statement**

*This place covers:*

Arrangements that block electromagnetic fields that are used to attempt access to wireless record carriers, wherein the arrangements carry out the blocking without the use of logical and/or intelligent [circuits]

Examples: metallic screens around an RFID tag for blocking an interrogation field in order to make sure that the RFID tag cannot be interrogated without permission

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

|   |                             |
|---|-----------------------------|
| Screening of semiconductor devices            | <a href="#">H01L 23/576</a> |
| Screening against electric or magnetic fields | <a href="#">H05K 9/00</a>   |

**Special rules of classification**

Shielding measures intended to protect the stored data belong in this class. This class is not used if shielding measures are intended to minimize undesired effects of mounting on e.g. metal and other electromagnetically interfering objects/surfaces. In this case: use class [G06K 19/07771](#).

**G06K 19/07336****{Active means, e.g. jamming or scrambling of the electromagnetic field}****Definition statement***This place covers:*

Arrangements comprising logical circuits that are suitable to actively and intelligently, using logical operations, interfere with an electromagnetic field that is used in an attempt to access information in record carrier

Example:

Blocking chipcard which prevents communication of other cards by repeated response under violation of waiting times defined in the communication protocol.

**G06K 19/07345****{by activating or deactivating at least a part of the circuit on the record carrier, e.g. ON/OFF switches}****Definition statement***This place covers:*

Arrangements on the record carrier that are suitable to switch at least a part of the logical circuit on the record carrier from an active to an inactive state or from an inactive to an active state in order to protect the contents of the record carrier or to provide privileged access to contents or processes on the data carrier.

Example:

Chip card in which the antenna is only connected to the chip if a user presses a mechanical switch.

**G06K 19/07363****{by preventing analysis of the circuit, e.g. dynamic or static power analysis or current analysis}****Definition statement***This place covers:*

Arrangements on the record carrier that are in place such that it is made difficult for a reverse engineer to analyze the construction of the circuit on the record carrier using non-invasive techniques.

Example:

Chipcard IC writing to dummy cells even if no real write operation is required.

**G06K 19/07381****{with deactivation or otherwise incapacitation of at least a part of the circuit upon detected tampering}****Definition statement***This place covers:*

Arrangements that deactivate temporarily or for good part of the logical circuit in the record carrier if a detection circuit on the same record carrier detects signs of attempted tampering with the record

carrier. The "detection" may be an active process on the record carrier that continuously monitors if tampering is attempted, or the detection may be directly lead to destruction of a circuit that is being tampered.

Example:

For instance, a chip is covered by a conductive cage, wherein the integrity of the cage is being actively monitored. If one of the wires of the cage is broken this is seen as a voltage drop by the monitoring circuit and the chip is warned of this fact.

## **G06K 19/0739**

**{the incapacitated circuit being part of an antenna}**

### **Definition statement**

*This place covers:*

Arrangements that deactivate temporarily or for good part of the logical circuit in the record carrier if a detection circuit on the same record carrier detects signs of attempted tampering with the record carrier, wherein the antenna is destructed upon the detected tampering. The detection in this case is directly also destruction of the circuit.

Example:

An RFID tag that is fixed to an object such that the RFID tag antenna will tear or break when detached from the object. In order to tamper with the RFID tag, the FRID tag needs to be detached from the object.

## **G06K 19/077**

**Constructional details, e.g. mounting of circuits in the carrier**

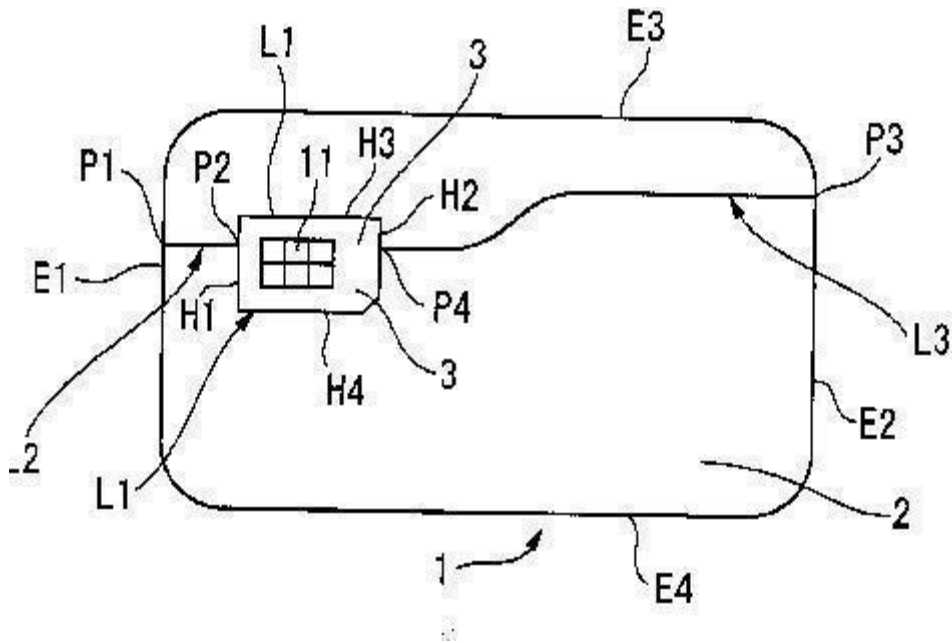
### **Definition statement**

*This place covers:*

All kinds of constructional peculiarities related to manufacturing, materials, special devices included in the data carrier like displays, sensors, batteries, etc are to be classified and searched. Also MMC cards are found here when no special features clearly for other fields are under consideration.

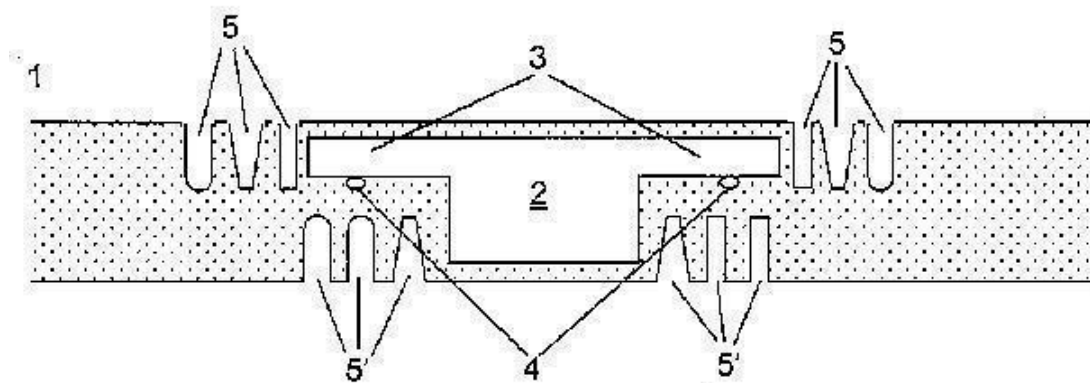
Examples:

removable sim cards



or special arrangements for avoiding breaking of the integrated circuit on a smart card:

Fig. 2



**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

|   |                               |
|---|-------------------------------|
| Holders, etuis, cases, for credit cards or the like       | <a href="#">A45C 11/182</a>   |
| Injection molding for cards                               | <a href="#">B29C 45/14647</a> |
| Processes for making labels or tags                       | <a href="#">B31D 1/02</a>     |
| Interconnection between memories and computers            | <a href="#">G06F 13/00</a>    |
| Acces protection for memory cards                         | <a href="#">G06F 21/00</a>    |
| Access control with a pass containing electronic elements | <a href="#">G07C 9/00119</a>  |
| Memory  | <a href="#">G11C</a>          |
| Connection arrangements for memory cards                  | <a href="#">H01R 13/00</a>    |

|  |                             |
|--|-----------------------------|
| Housings for electronic devices, such as memory sticks or other memory cards | <a href="#">H05K 5/0256</a> |
|--|-----------------------------|

## G06K 19/07743

### {External electrical contacts}

#### Definition statement

*This place covers:*

Record carriers with an integrated circuit chip and with galvanic contacts at the surface of said record carriers, such as ISO 7816 smart cards.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|  |   |
|--|---|
| Sensing record carriers by galvanic contacts       | <b>G067K/00K</b>  |
| Arrangements for conducting current for flat cards | <a href="#">H01L 23/49855</a> ,<br><a href="#">H01L 23/5388</a> |

## G06K 19/07745

### {Mounting details of integrated circuit chips}

#### Definition statement

*This place covers:*

Record carriers with an integrated circuit chip wherein the integrated circuit chip is mounted into a card body, or the like, as a module.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

|                                       |                            |
|---------------------------------------|----------------------------|
| Semiconductor technology (in general) | <b>H01L23/25</b>           |
| Encapsulation of chip modules         | <a href="#">H01L 23/28</a> |

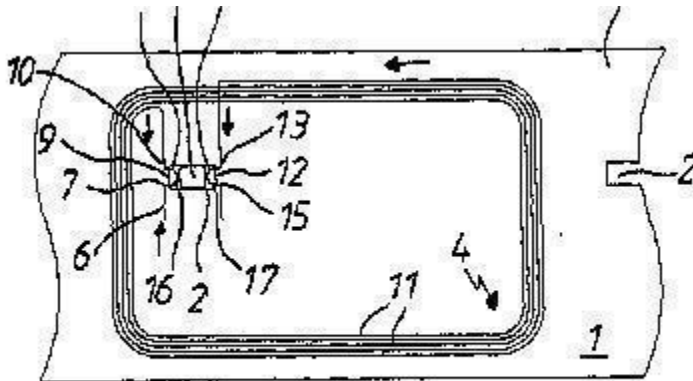
**G06K 19/07749**

{the record carrier being capable of non-contact communication, e.g. constructional details of the antenna of a non-contact smart card}

**Definition statement**

*This place covers:*

[G06K 19/07749](#) is for constructional details particular for non-contact data carriers, such RFIDs, e.g. methods of placing the antenna wire on the data carrier:

**G06K 19/08**

using markings of different kinds {or more than one marking of the same kind} in the same record carrier, e.g. one marking being sensed by optical and the other by magnetic means

**Definition statement**

*This place covers:*

[G06K 19/08](#) and lower contains data carriers with two different types of markings, e.g., a bar code and a magnetic stripe on the same data carrier.

**G06K 19/083**

{Constructional details}

**Definition statement**

*This place covers:*

This head group is not used anymore to classify new documents. Please classify in its lower subgroup [G06L19/086](#) instead.



## G06K 19/086

{with markings consisting of randomly placed or oriented elements, the randomness of the elements being useable for generating a unique identifying signature of the record carrier, e.g. randomly placed magnetic fibers or magnetic particles in the body of a credit card}

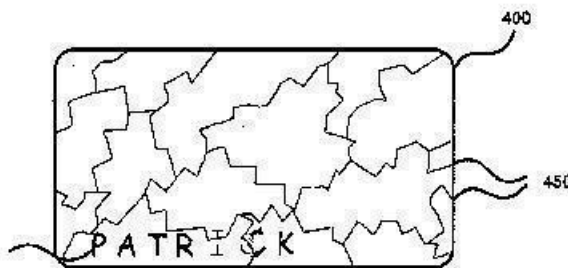
### Definition statement

*This place covers:*

Markings consisting of randomly placed or oriented elements, the randomness of the elements being for generating a unique identifying signature of the record carrier, e.g., randomly placed magnetic fibres or magnetic particles in the body of credit card.

Example:

A card comprising a pattern of random cracks from which a digital signature is derived.



## G06K 19/10

at least one kind of marking being used for authentication, e.g. of credit or identity cards ({identification cards not to be read by a machine [B42D 25/00](#); } verification of coded identity or credit cards in mechanisms actuated by them [G07F 7/12](#) {; printed identity or similar identification-bearing cards not for use with a machine [B42D 25/00](#)})

### Definition statement

*This place covers:*

Record carriers that comprise a first type and a different second type of digital marking wherein one of these digital markings is particularly suited for authenticating the record carrier. Examples:

copy protected DVD comprising a required decoding key in an RFID transponder incorporated in the DVD body.

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

|                               |   |
|-------------------------------|---|
| Card operated payment systems | <a href="#">G07F 7/08</a> , <a href="#">G07F 7/10</a> |
|-------------------------------|---|