

G06K

GRAPHICAL DATA READING (image or video recognition or understanding [G06V](#)); PRESENTATION OF DATA; RECORD CARRIERS; HANDLING RECORD CARRIERS

Definition statement

This place covers:

Methods or arrangements for reading printed or written characters; 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:

Image or video recognition or understanding	G06V
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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	B07C
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	G06F 3/033

Informative references

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

Printing per se	B41J
Transponders powered by received radio waves, e.g. passive transponders	G01S 13/75
Tags attached to, or associated with, an object, in order to enable detection of the object	G01V 15/00
Magnetic head applications	G11B 5/31

Magnetic alloy thin films, such as used in magnetoresistive applications in magnetic heads	G11B 5/39
Magnetic alloy thin films, such as used in magnetic thin film media applications	G11B 5/64
Magnetic alloy thin films, such as used in static memory applications	G11C 11/00
Responders; Transponders	H04B 1/59
Near-field transmission systems using transceiver	H04B 5/48

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 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

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](#).

References

Informative references

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

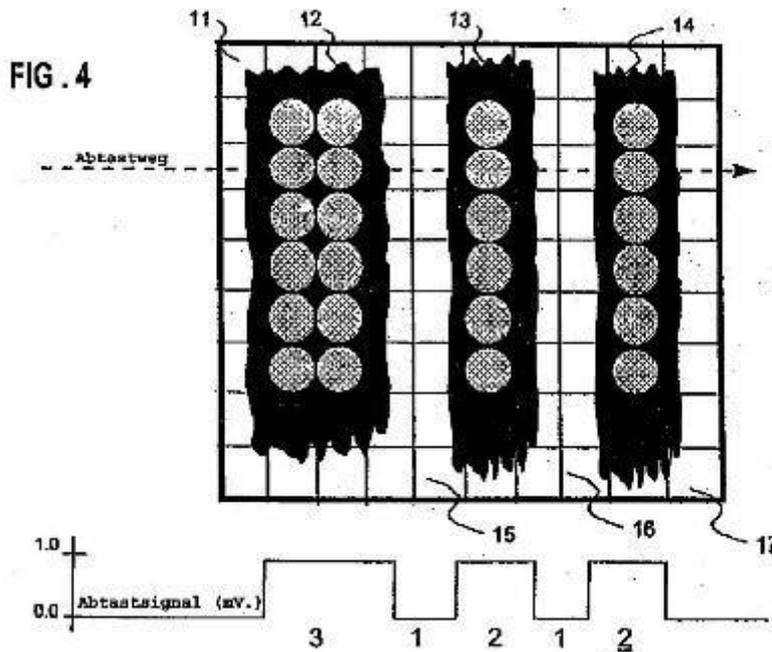
Translating markings on a record carrier into printed data on the same record carrier, i.e. Interpreting	G06K 3/02
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Special rules of classification

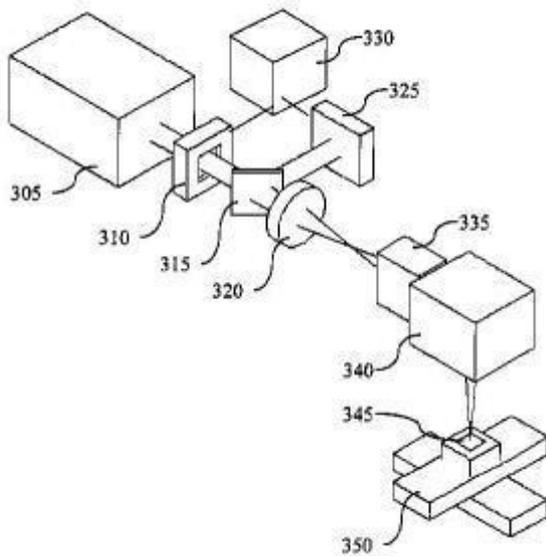
Methods of marking or printing of barcodes and other optically detectable digital codes should be classified in [G06K 1/12](#) and lower

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 1/02

by punching

References

Informative references

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

punching in general	B26F
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G06K 1/04

controlled by sensing markings on the record carrier being punched

References

Informative references

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

sensing of record carriers	G06K 7/00
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G06K 1/10

Tape punches

References

Informative references

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

specially adapted for a particular purpose, e.g. for telegraphy	H04L
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G06K 1/12

otherwise than by punching

References

Informative references

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

printing in general	B41J
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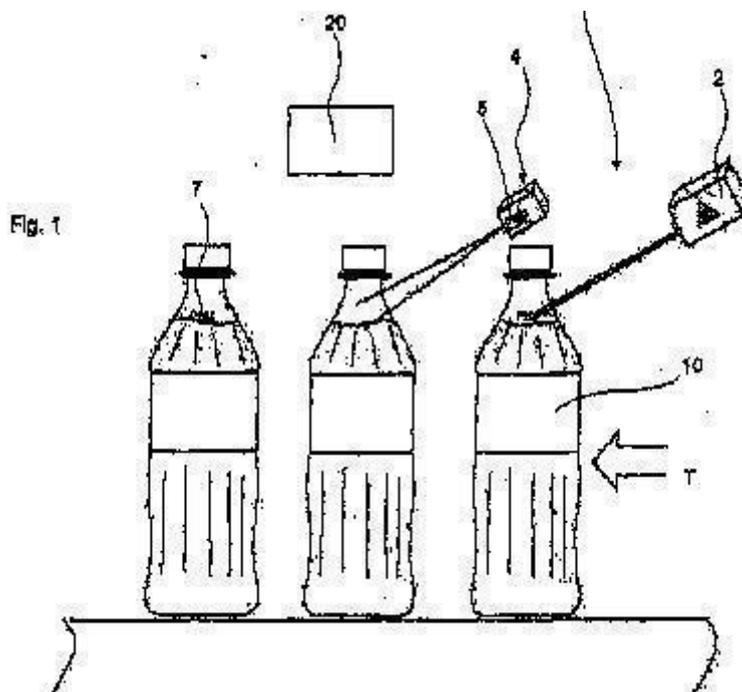
G06K 5/00

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

Informative references

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

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

G06K 7/00

Methods or arrangements for sensing record carriers, {e.g. for reading patterns} (methods or arrangements for marking the record carrier in digital fashion [G06K 1/00](#); pattern recognition [G06F 18/00](#); arrangements for image or video recognition or understanding [G06V 10/00](#); character recognition, recognising digital ink or document-oriented image-based pattern recognition [G06V 30/00](#))

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

Limiting references

This place does not cover:

Methods or arrangements for marking the record carrier in digital fashion	G06K 1/00
Pattern recognition	G06F 18/00
Arrangements for image or video recognition or understanding	G06V 10/00
Character recognition, recognising digital ink or document-oriented image-based pattern recognition	G06V 30/00

Informative references

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

Identification of animals	A01K 11/00
Marking of poultry and the like	A01K 35/00
Receptacle for credit cards, such as etuis	A45C 11/18
Check-out counters, e.g. including a barcode scanner	A47F 9/046
Implanted circuitry (for diagnostics)	A61B 5/00
Detecting for diagnostic purposes	A61B 5/117
Sorting of articles according to an identifier or destination marking	B07C 3/18
Sorting using a machine readable code	B07C 5/34
Printing of security markings	B41M 3/14
Card filing arrangements	B42C 17/00
Printed mater of special format, e.g. identity or credit cards	B42D 15/00
Containers for laboratory use carrying an identifier, e.g. an RFID or barcode	B61L 3/14
Indicating train identities using tags	B61L 25/04
Transponders fixed to bicycles	B62H 5/20
Labelling machines, e.g. fixing machines to fix a label with a bar code to a package	B65C

Informative references

Refuse receptacles carrying identification means	B65F 1/14
Article conveyance distributing the articles according to bodily destination marks, e.g. in production lines	B65G 47/49
Stacking and de-stacking of flat articles, e.g. stacking plural card shaped objects	B65H
Marking arrangements for laundry purposes, e.g. to track laundry using RFID tags	D06F 93/00
Paper including security elements, e.g. methods to create a paper support carrying an RFID	D21H 21/40
Details of vessels, means for coding or identifying them	F17C 13/003
Recording measures values, e.g. using sensors	G01D 9/00
Position detection of objects using reflection of radio waves on passive responders, e.g. with exchange of information between interrogator and responder	G01S 13/00
Tags for enabling detection of objects, e.g. to locate underground oil pipes or landmines	G01V 15/00
Scanning systems	G02B 26/10
Computer security in general	G06F 21/00
Business methods using RFIDs or barcodes or the like	G06Q
Tachographs using smart cards or the like for recording	G07C 5/08
Access control using an identification card, opening of card doors using a transponder	G07C 9/00
Payment using cards	G07F 7/08 , G07F 7/10
Cash registers using barcode scanning	G07G 1/00
Partner search systems using transponders	G08B 1/08
Anti-theft systems using transponders or the like	G08B 13/24
Identification of vehicles	G08G 1/017
Labels, tags, tickets and security seals	G09F 3/02 , G09F 3/03 , G09F 3/20
Recording reproducing or erasing on magnetic carriers in general	G11B 5/00
Optical recording on flat record carriers other than barcode recording	G11B 7/00
Optical recording on CDs, DVDs and the like	G11B 20/00 , G11B 23/00
CD's with transponders	G11B 23/20 , G11B 20/00
Circuit means for protection against loss of information of semiconductor storage device, e.g. on cards against alpha rays inducing soft errors	G11C 5/00
Contactless power supplies for memory stores	G11C 5/14
Manufacturing coils not particular for non contact smart cards	H01F 41/00
Cards including details of the manufacturing of the semiconductor device	H01L 23/498 , H01L 23/538
Antennas design details	H01Q 1/22
SAW circuits not for record carriers	H03H 9/64
SIM card connection arrangements particular for mobile phones	H04B 1/38
Near field transmission systems not RFID type	H04B 5/00

Wireless local area networks	H04L 12/28
Mobile phones with a barcode reading functionality	H04M 1/72433
Digital cameras combined with a further device (e.g. a mobile phone)	H04N 1/00
Wireless networks in general	H04W
Conductive patterns on PCBs other than on smart cards	H05K 3/10
Casings cabinets drawers for interchangeable modules	H05K 5/02
Faraday type of protections of electrical circuits	H05K 9/00

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}

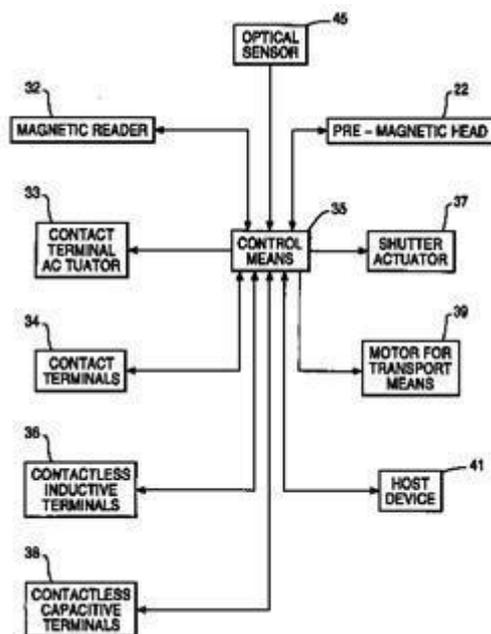
Definition statement

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.

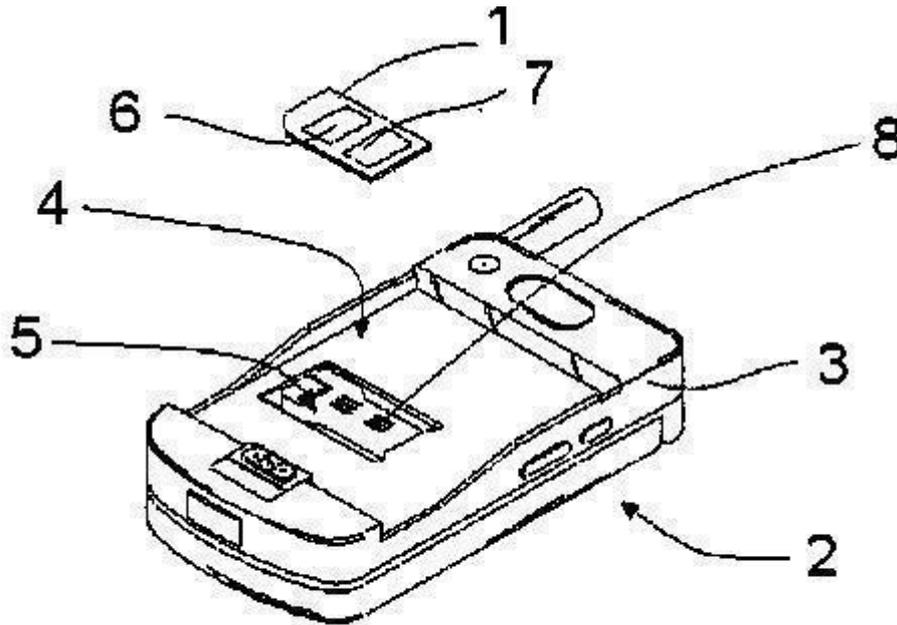
G06K 7/0013

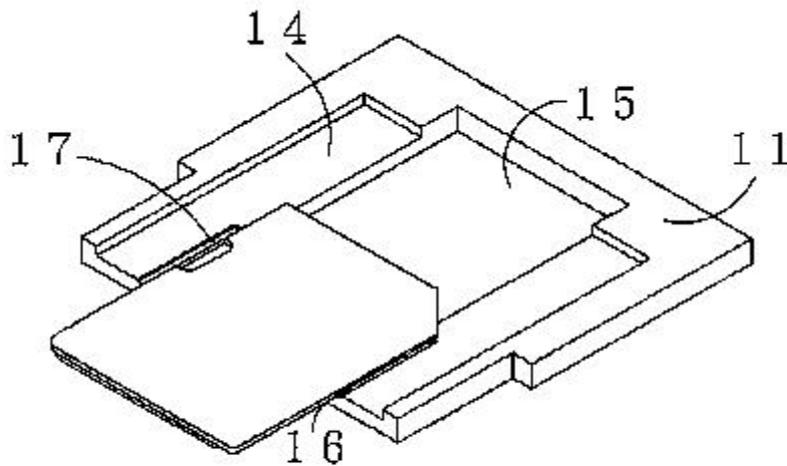
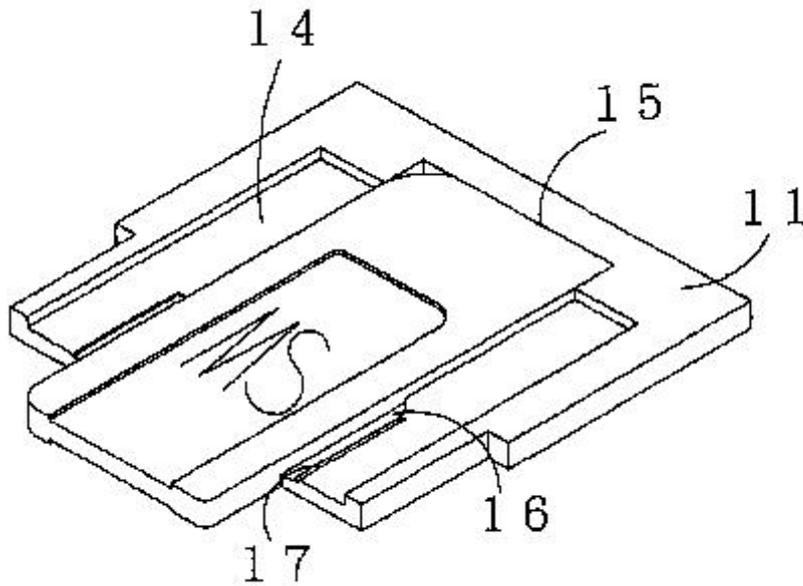
{by galvanic contacts, e.g. card connectors for ISO-7816 compliant smart cards or memory cards, e.g. SD card readers (connectors in general [H01R 13/00](#); connectors for SIM cards used in mobile phones or the like [H04B 1/3816](#))}

Definition statement

This place covers:

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





G06K 7/015

Aligning or centering of the sensing device with respect to the record carrier

References

Informative references

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

Information storage based on relative movement between record carrier and transducer in general	G11B
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G06K 7/016

Synchronisation of sensing process

References

Informative references

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

Information storage based on relative movement between record carrier and transducer in general	G11B
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G06K 7/10009

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

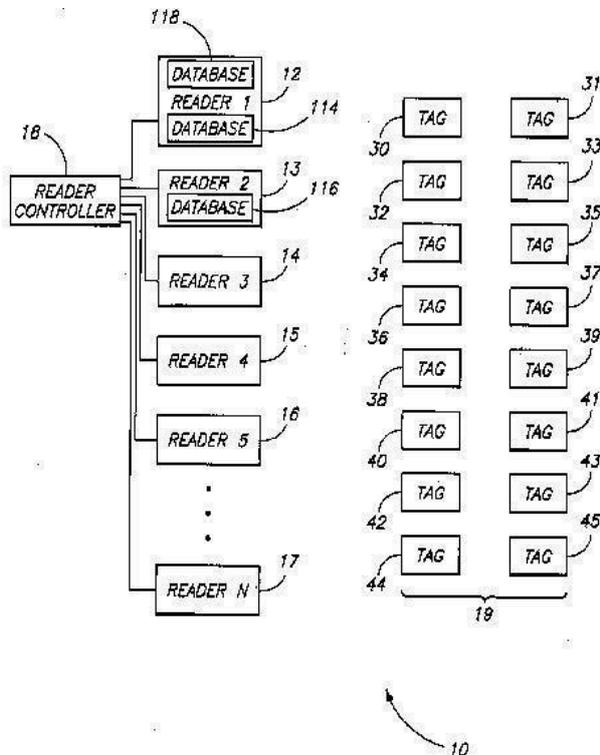
Definition statement

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

G06K 7/10297

{arrangements for handling protocols designed for non-contact record carriers such as RFIDs NFCs, e.g. ISO/IEC 14443 and 18092 (cryptographic protocols [H04L 9/00](#); network security protocols [H04L 63/00](#); real-time communication protocols in data switching networks [H04L 65/00](#); network protocols for data switching network services [H04L 67/00](#))}

References

Limiting references

This place does not cover:

Cryptographic mechanisms or cryptographic; arrangements for secret or secure communications; Network security protocols	H04L 9/00
Network architectures or network communication protocols for network security	H04L 63/00
Network arrangements, protocols or services for supporting real-time applications in data packet communication	H04L 65/00
Network arrangements or protocols for supporting network services or applications	H04L 67/00

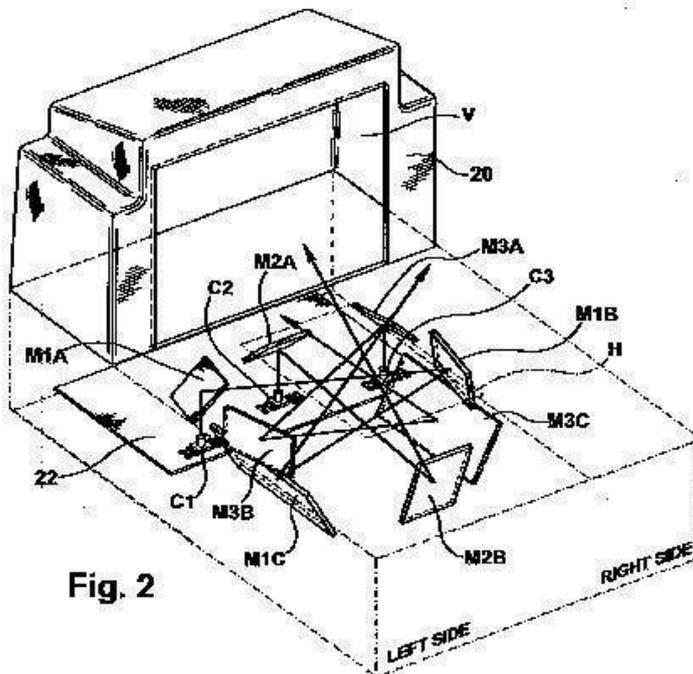
G06K 7/10544

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

Definition statement

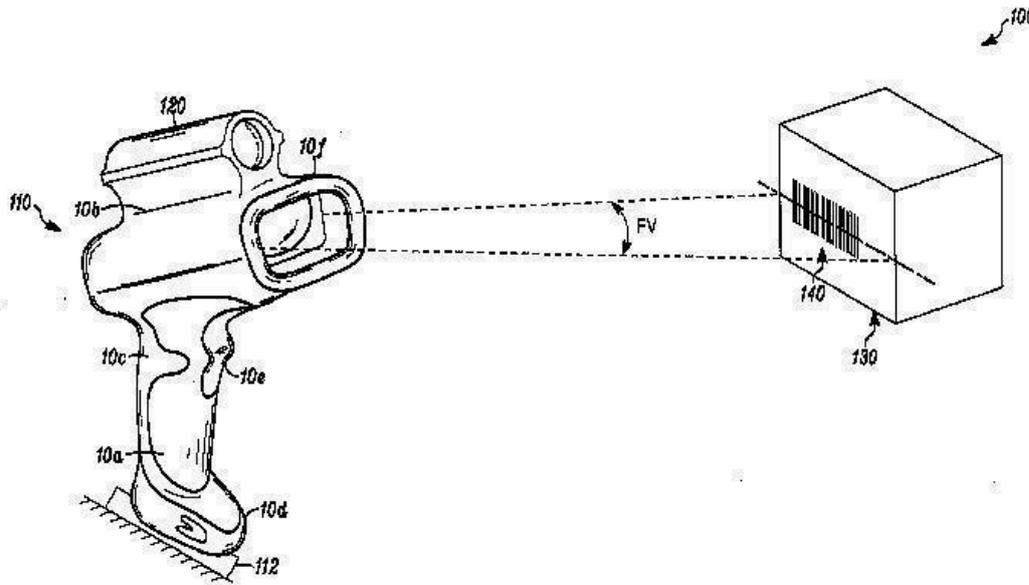
This place covers:

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



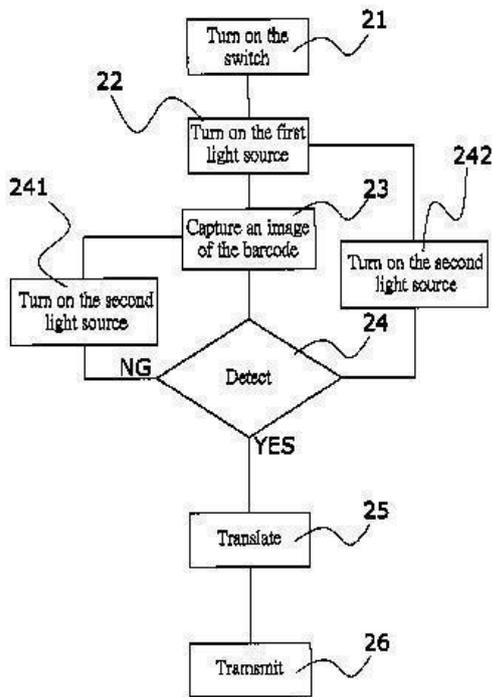
G06K 7/10881**{constructional details of hand-held scanners}****Definition statement***This place covers:*

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

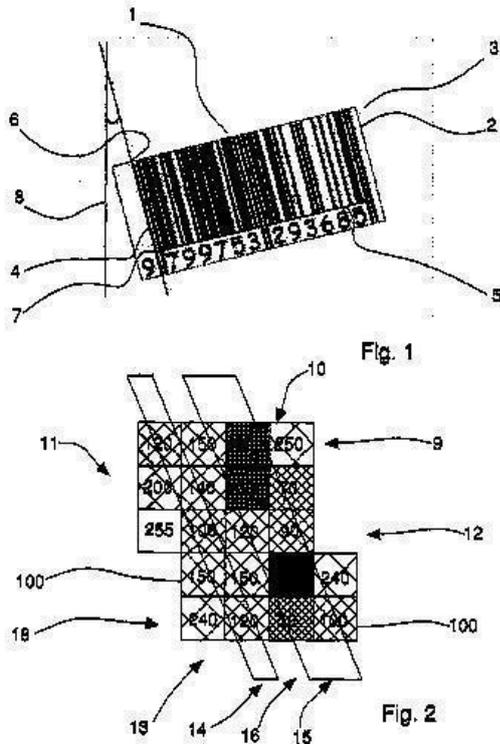
using light without selection of wavelength, e.g. sensing reflected white light
{(G06K 7/10831 - G06K 7/1097 take precedence)}

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 11/00

Methods or arrangements for graph-reading or for converting the pattern of mechanical parameters, e.g. force or presence, into electrical signal (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](#); combined with pattern recognition [G06F 18/00](#); arrangements for image or video recognition or understanding [G06V 10/00](#); character recognition, recognising digital ink or document-oriented image-based pattern recognition [G06V 30/00](#); 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 (conveying record carriers combined with another operation, e.g. with reading [G06K 17/00](#))

Definition statement

This place covers:

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

References

Limiting references

This place does not cover:

Conveying record carriers combined with another operation, e.g. with reading	G06K 17/00
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Informative references

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

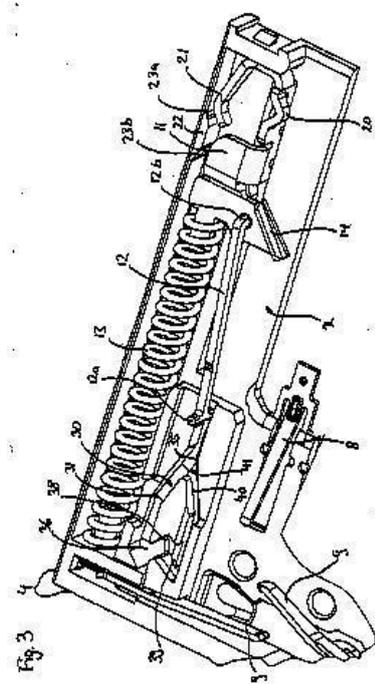
Transport devices in general	B65G
Handling thin or filamentary material in general	B65H
Handling of coins or of paper currency or of similar valuable papers	G07D

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 13/14

Card magazines, e.g. pocket, hopper

References

Informative references

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

card magazines in general	B42F
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G06K 13/18

the record carrier being longitudinally extended, e.g. punched tape

References

Informative references

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

features of interest apart from data processing	G11B
magnetic-tape drive	G11B 15/00

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](#))

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	B41
Printer drivers	G06F 3/12
Image processing	G06T

References

Limiting references

This place does not cover:

Printing or plotting combined with another operation, e.g. with conveying	G06K 17/00
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Informative references

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

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

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
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Synonyms and Keywords

In patent documents, the following abbreviations are often used:

PDL	Page Description Language
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RIP	Raster Image Processing
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G06K 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

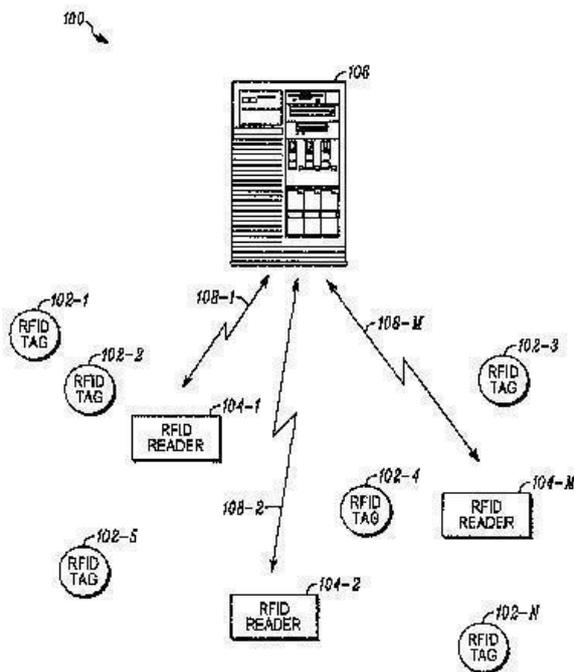
Definition statement

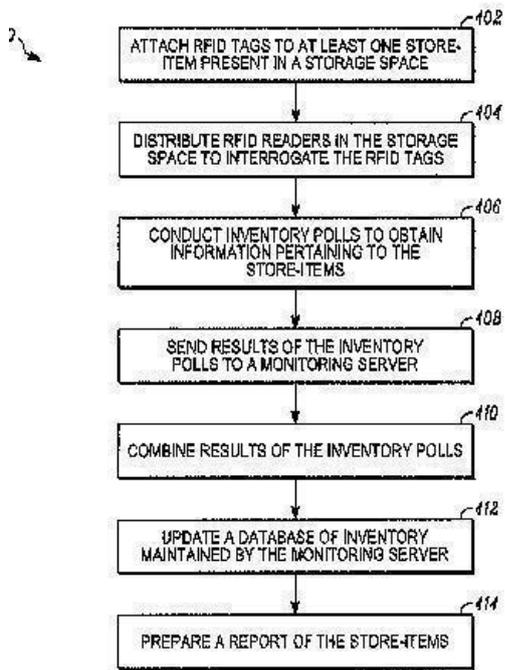
This place covers:

- 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.

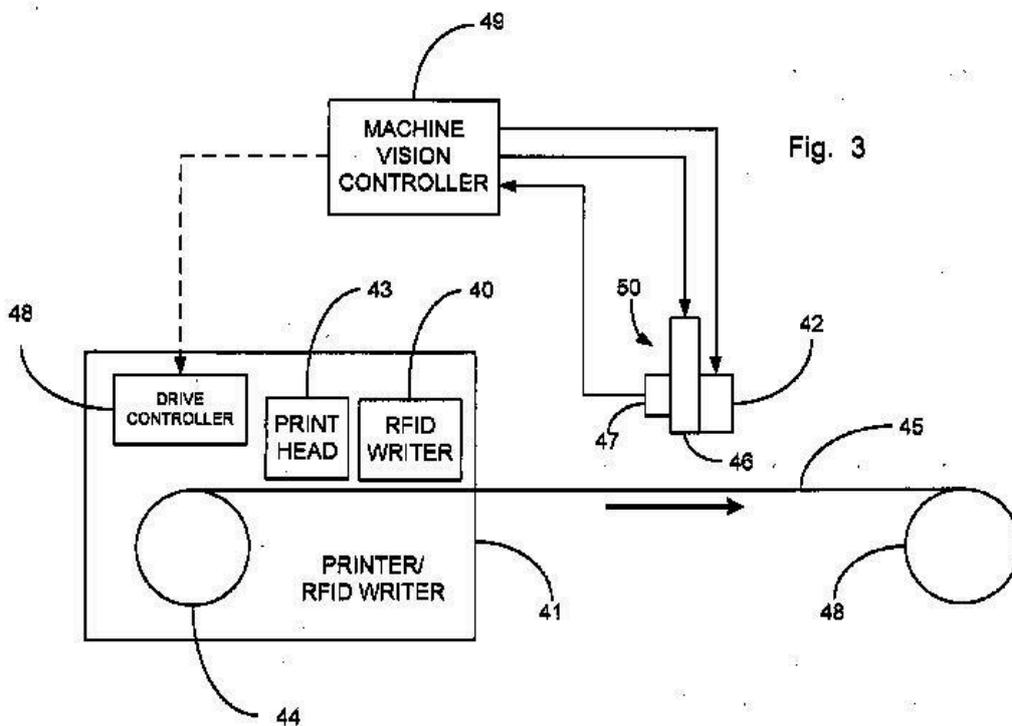
Further classification information:

[G06K 17/0022](#) contains inventory control systems:

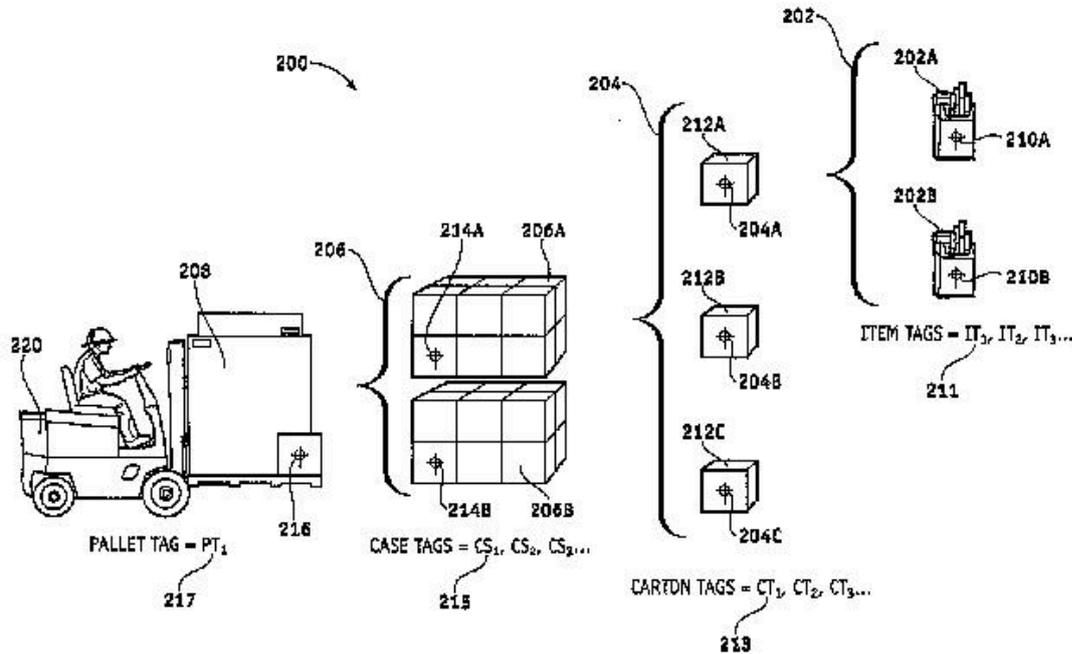




[G06K 17/0025](#) covers combined RFID - printing systems, like the typical RFID label writers:



[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	G06K 5/02
Collecting milk	A01K 11/00
Medical systems in general	A61
Test tubes with identification means	B01L 3/5453
Labelling machines using RFIDs	B65C 2009/0003
Collecting waste	B65F 1/00
Logistics using RFIDs or barcodes	G06Q 10/08
Inventory control using RFIDs or barcodes	G06Q 10/08
Access-control involving the use of a pass, e.g. tag, transponder	G07C 9/20
Personalization of a card	G07F 7/1008
Theft detection systems using tags	G08B 13/2402
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	G16H 10/65

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

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:

Record carriers adapted for controlling specific machines, see the appropriate subclass for the machine	B23Q ; D03C ; G10F ; H04L
Plastic moulding techniques for card shaped objects, such as smart cards	B29C 45/14
Lamination suitable for card shaped articles	B32B 37/00
Form printing	B41
Printing or marking of cards not characterised by the kind of marking	B42D 15/00
File cards	B42F 19/00
Operating system software for smart cards	G06F 9/44
Data input/out arrangements, such as buses, to transfer data from/to smart cards	G06F 13/38
General arrangements for computer security	G06F 21/00
Arrangements on smart cards for sensing fingerprints	G06V 10/10
Cards for automatic access control systems	G07C 9/00
Record carriers made for e.g. of paper or other flexible material, suitable for use as a banknote	G07D 7/00
Smart cards for payment	G07F 7/00
Antitheft arrangements using RFIDs	G08B 13/24
Labels for tamper secure fixing to objects	G09F 3/03
Record carriers in general	G11
Recording by magnetisation or demagnetisation of a record carrier	G11B 5/00
Details of memory layout in smart cards	G11C 5/00
Manufacturing of the integrated circuit in a smart card	H01L 23/00
Security software for smart cards and RFIDs using encryption	H04L 9/00
Manufacturing of printed circuits on a smart card	H05K 3/00

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	G06K 19/06009
Magnetic stripes as used on e.g. credit cards.	G06K 19/06187
Functionality of contact based smart cards	G06K 19/07
Arrangements for protection the integrated circuit in smart card against intrusion	G06K 19/073
Constructional details for non-contact smart cards, RFIDs, transponders or wireless tags	G06K 19/07749
Functionality of non-contact smart cards, RFIDs, transponders or wireless tags	G06K 19/0723
Constructional details for contact-based smart cards	G06K 19/077

G06K 19/02

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

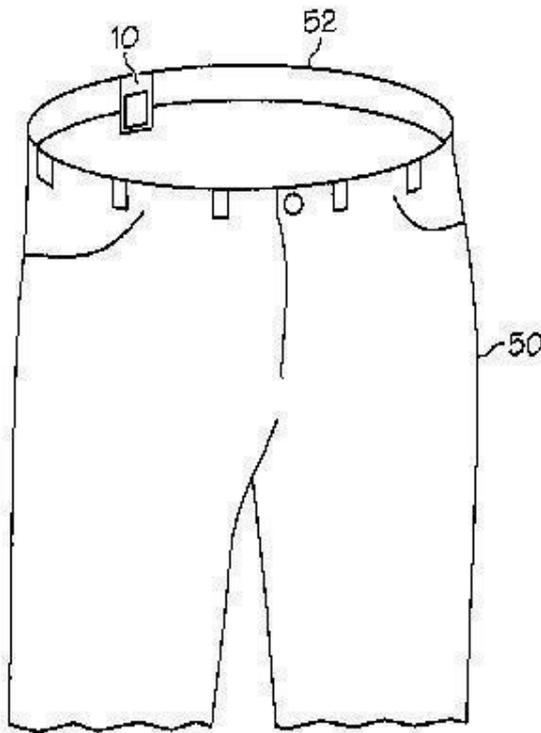
Definition statement

This place covers:

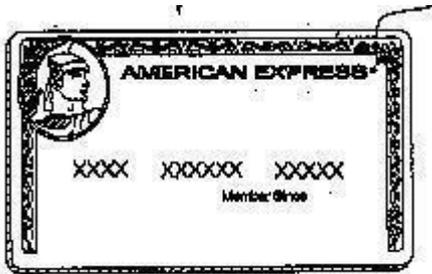
The selected material of the record carrier achieves an extra effect which is not directly related to the function as record carrier.

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

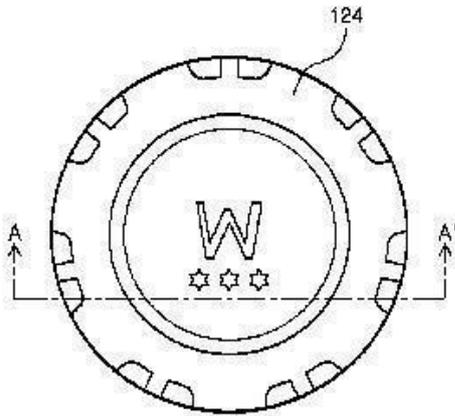
Definition statement

This place covers:

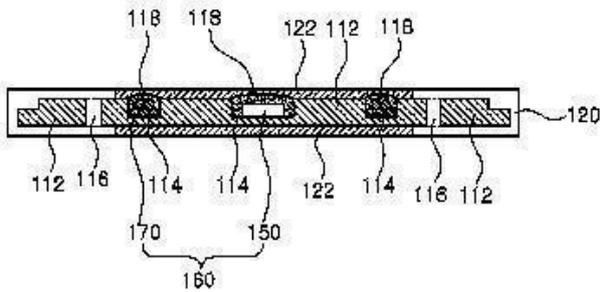
Different peculiar form factors.

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

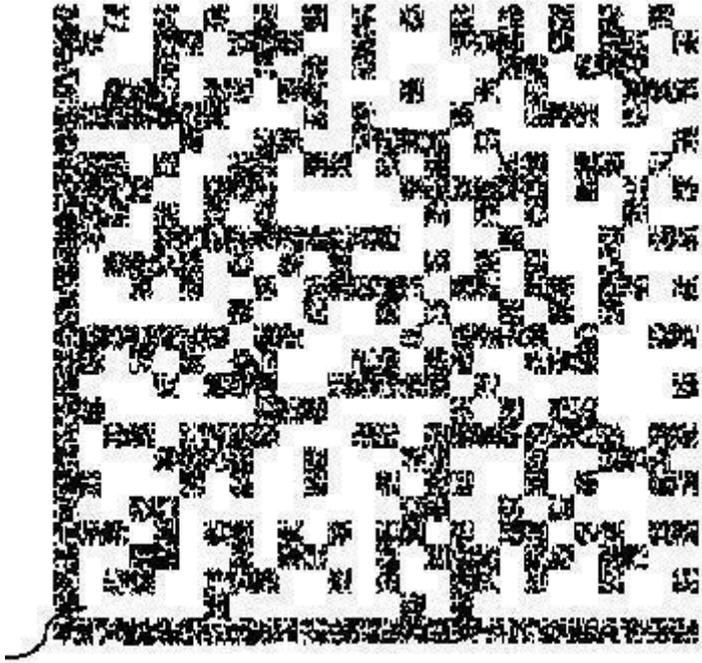
{with optically detectable marking ([G06K 19/063](#), [G06K 19/08](#) take precedence)}

Definition statement

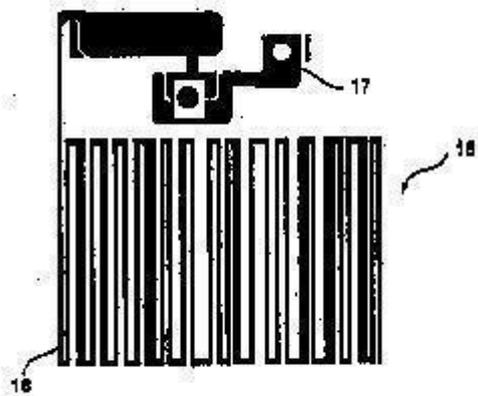
This place covers:

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	G06K 2019/0629
Wavelength selection	G06K 2019/06225
Miniature code	G06K 2019/06234

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](#)).

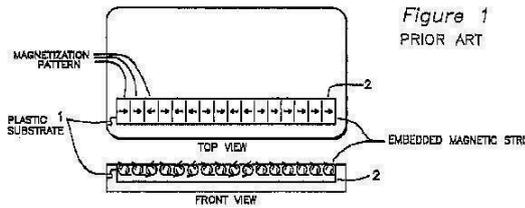


Figure 1
 PRIOR ART

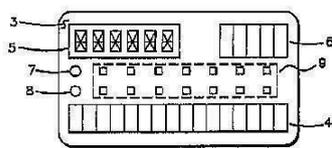


Figure 2

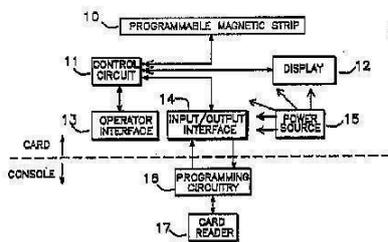


Figure 3

References

Informative references

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

Magnetic theft detection tags	G08B
Magnetic recording with relative movement between data carrier and transducer	G11B 5/00
Magnetic alloy thin films as used in magnetoresistive application in static memory applications	G11C 11/00

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

Informative references

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

Relief-type marking	G06K 2019/06271
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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}

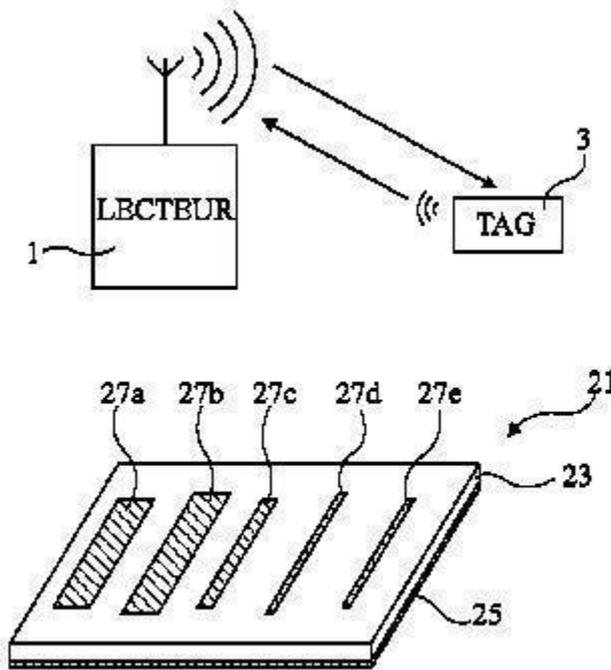
Definition statement

This place covers:

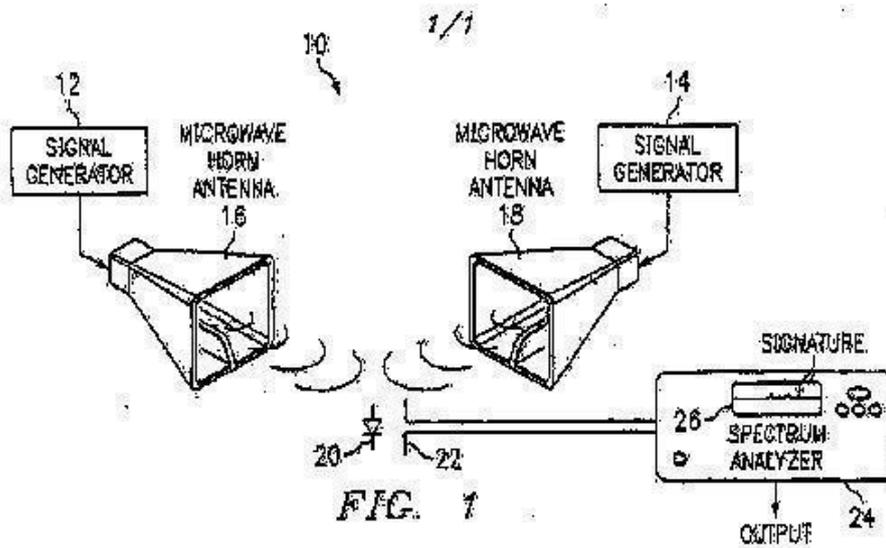
Record carriers that do not comprise a logical or integrated circuit and that reflect a digital code upon interrogation by an electromagnetic field.

Examples:

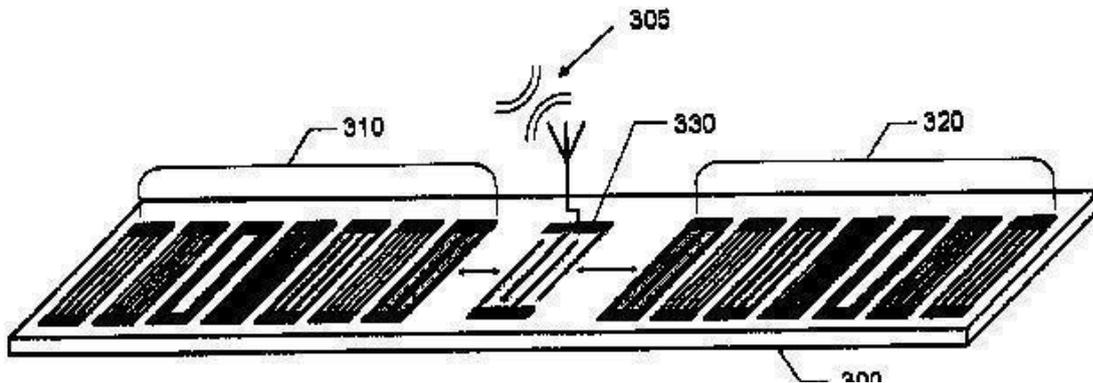
record carrier comprising a plurality of resonating LC circuits



or e.g.



or surface acoustic wave (SAW) transponders



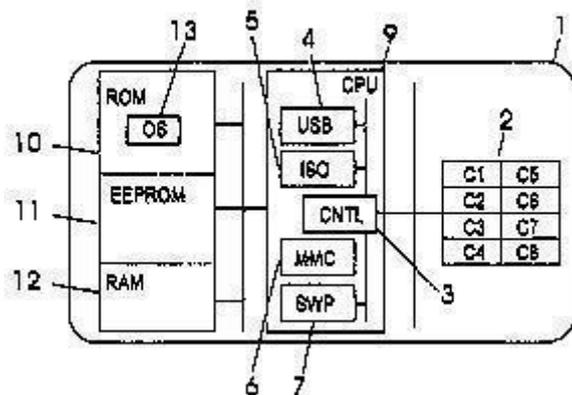
G06K 19/07

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	G11C 16/00
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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}

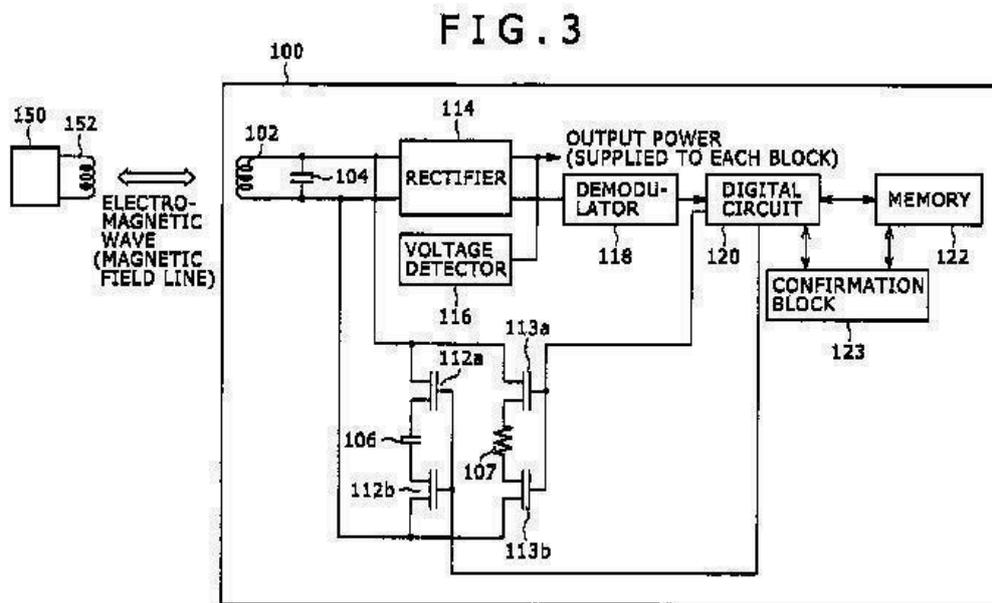
Definition statement

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	G01S 13/765
System with exchange of information between initiator and responder	G01S 13/765
Near-field transmission systems	H04B 5/00

G06K 19/073

Special arrangements for circuits, e.g. for protecting identification code in memory (protection against unauthorised use of computer memory [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.

Protection against unauthorised use of computer memory	G06F 12/14
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Informative references

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

Security arrangements in computer systems	G06F 21/00
Smart cards for payment	G07F 7/10
Secure smart card communication using encryption	H04L 9/00

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	H01L 23/576
Screening against electric or magnetic fields	H05K 9/00

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

Definition statement

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

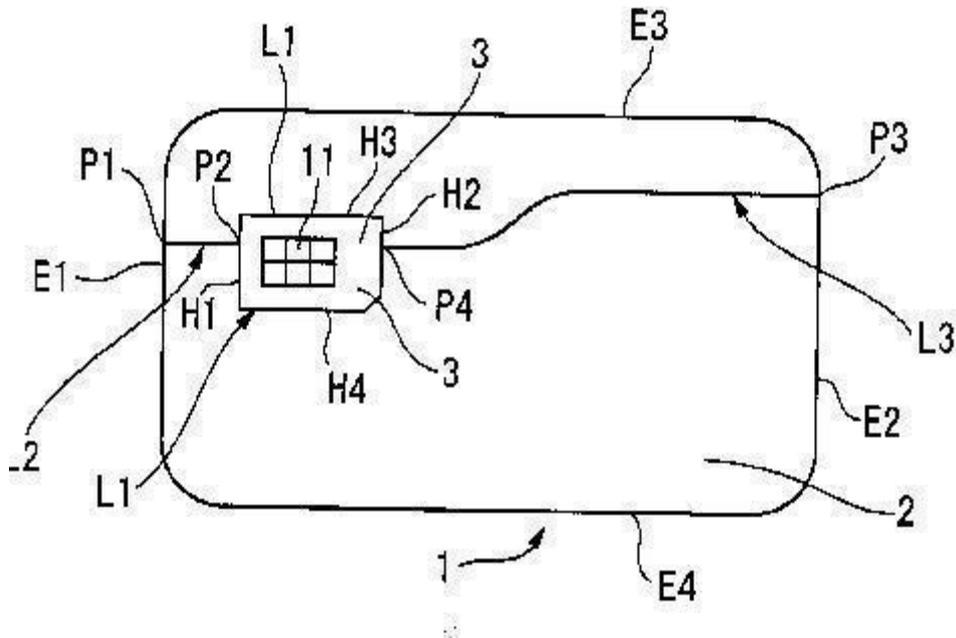
Definition statement

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.

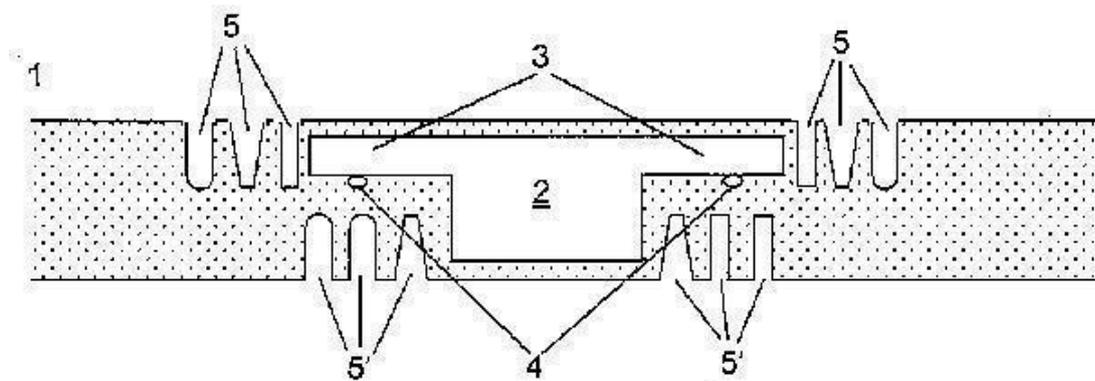
Examples:

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	A45C 11/182
Injection molding for cards	B29C 45/14647
Processes for making labels or tags	B31D 1/02
Interconnection between memories and computers	G06F 13/00
Acces protection for memory cards	G06F 21/00
Access control with a pass containing electronic elements	G07C 9/29
Memory	G11C
Connection arrangements for memory cards	H01R 13/00

Housings for electronic devices, such as memory sticks or other memory cards	H05K 5/0256
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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	G067K/00K
Arrangements for conducting current for flat cards	H01L 23/49855 , H01L 23/5388

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)	H01L23/25
Encapsulation of chip modules	H01L 23/28

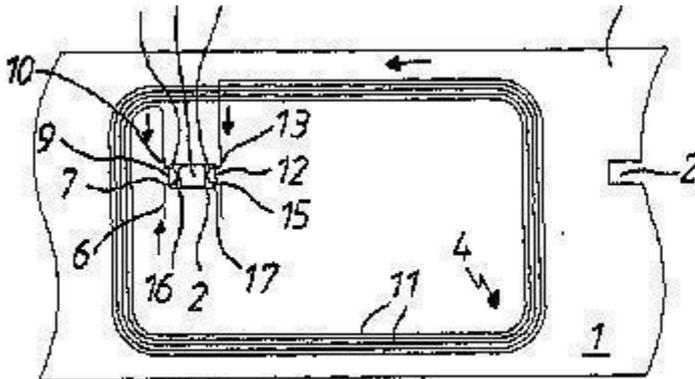
G06K 19/07749

{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}

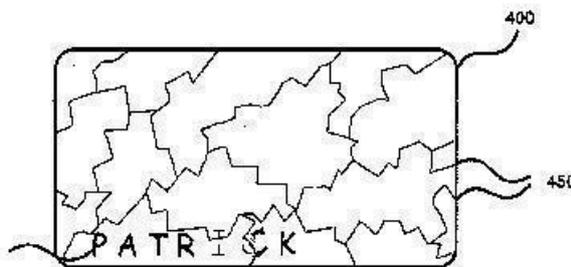
Definition statement

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 (verification of coded identity or credit cards in mechanisms actuated by them [G07F 7/12](#))

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

Limiting references

This place does not cover:

Verification of coded identity or credit cards in mechanisms actuated by them	G07F 7/12
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Informative references

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

Identification cards not to be read by a machine	B42D 25/00
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Card operated payment systems	G07F 7/08 , G07F 7/10
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G06K 21/06

Apparatus or tools adapted for slotting or otherwise marking information-retrieval cards

References

Informative references

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

tools for perforating in general	B26F
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