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(71) Applicant *(for all designated States except US)*: **LOGO-MOTION, S.R.O.** [SK/SK]; Winterova 15, 921 01 Piešťany (SK).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HUBINÁK, Emil** [SK/SK]; JUDr. Emil Hubinák, Beethovenova 4, 921 01 Piešťany (SK). **FLOREK, Miroslav** [SK/SK]; Ing. Miroslav Florek, Sedmokráskova 4, 821 01 Bratislava (SK). **MASARYK, Michal** [SK/SK]; Ing. Michal Masaryk, PhD., Medzilaborecká 7, 821 01 Bratislava (SK).

(74) Agent: **PORUBČAN, Róbert**; Kancelária pre patenty a ochranné známky, Puškinova 19, 900 28 Ivanka pri Dunaji (SK).

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(54) Title: METHOD, CONNECTION AND DATA CARRIER TO PERFORM REPEATED OPERATIONS ON THE KEYBOARD OF MOBILE COMMUNICATION DEVICE

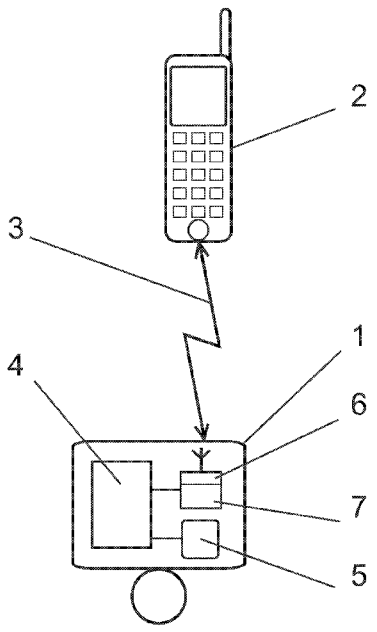

Fig. 1

(57) Abstract: When processing repeated operations on the keyboard of a mobile communication device, mainly at direct debits, used is a separate data carrier with a memory in which is stored at least one file with a sequence of keyboard orders of a macro type. Data carrier is energetically supplied contact- free by electromagnetic field of the mobile communication device while receiving the requiring order and, according to this order, chooses from the memory and encodes appropriate file with a sequence of keyboard orders. Data carrier sends the encoded file into the mobile communication device which decodes the received file and performs processes representing the keystrokes according to the sequence of keyboard orders. The invention also describes connection and data carrier to perform above described method where the data carrier consists of a processor, transmitting and receiving unit, block for transforming electromagnetic field and a memory to store a file of orders.

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— *with international search report (Art. 21(3))*

— *with amended claims (Art. 19(1))*

METHOD, CONNECTION AND DATA CARRIER TO PERFORM REPEATED OPERATIONS ON THE KEYBOARD OF MOBILE COMMUNICATION DEVICE

FIELD OF INVENTION

The invention relates to a method and a connection to perform repeated sequence of operations on the keyboard of a mobile communication device, principally a mobile phone, at payment applications using a sequence of keyboard orders of a macro type. The invention also concerns a data carrier which is instrumental to protected storage of files with a sequence of keyboard orders according to which the substitution of keystrokes is performed.

PRESENT TECHNOLOGY STATUS

A mobile phone is commonly used for many operations at which the communication is performed via a keyboard. However, keyboard usually consists of multi-purpose cumulative keys for letters and numbers so entering word, rather letter data or orders is time-consuming and difficult.

When using a mobile phone at the payment applications, usually the name, the account number and other data need to be entered. Although these data are entered repeatedly, it would not be safe to store simplifying orders, such as macros in the phone itself.

Many patents, as according to KR20020012738 describe the creation of macro files in a mobile communication device. However, they do not cover the need to protect macro file initiation against unauthorized person. The solution according to patent JP2006033229A allows operating macro files through a voice control but still does not solve the security of data included in macro file in unprotected part of the mobile communication device memory. Likewise, patent according to KR20070093133A describes the way of order initiation, still does not solve the protection of data possibly

included in command files. Some solutions, like for example included in patent US6615243B1 allow separate building of macro file where the macro files are, after their formation, transmitted and performed in the computer itself. Although the creation of macro files is easier, it does not solve the security since these solutions have the only goal and that is to increase the comfort. Similar effect arises by using external, adequate keyboard connected to the mobile communication devise as for patent KR20020051696A.

The invention according to WO2005057316 recognizes the use of RF components while using macro functions but still does not allow file cryptography with the sequence of keyboard orders and so does not solve the security problem according to described demands at the payment operations.

Known are no technical means or methods which would allow a secure realization of repeated sequence of operations on a mobile phone keyboard by means of an external data carrier.

BACKGROUND TO INVENTION

Disadvantages mentioned above are eliminated significantly by the method of realization repeated operations on the keyboard of a mobile communication device, principally a mobile phone, at direct debits using a sequence of keyboard orders of a macro type according to this invention, of which the bottom line is the use of a separate data carrier with a memory on which at least one file with a sequence of keyboard orders is stored. The sequence of keyboard orders is given by the sequence of keystrokes as if it was done by the owner. In order to perform the operation on the keyboard of a mobile communication device, the data carrier and the mobile communication device is connected via a contact-free communication link and the file with a sequence of keyboard orders is sent to the mobile communication device. This operation represents a substitution for pressing the particular keys. The use of separate, detached data carrier of files with a sequence of keyboard orders allows increasing the security of such file. By theft or loss, no risk of information misuse is arisen. Up to the present, separate storage of macro files is not known, in up to now known solutions

was the security of macro files realized by protecting the access to macro file itself which was though stored within a device, in which it was or could be realized.

It is advantageous if the file with a sequence of keyboard orders is not saved in memory of the data carrier as access free but it is processed in the data carrier and shows externally in the form of cryptography. By reason of comfortable usage it is suitable if the data carrier gains its energy to process the file from a mobile communication device, favorably contact-free by transformation of electromagnetic field of the mobile communication device.

To reach higher level of security by preserving the same comfort of manipulation it is advantageous to perform the operations on the keyboard of a mobile communication device in such way that a requiring signal is transmitted from a mobile communication device via contact-free communication link into the data carrier approached to the mobile communication device, preferably approached to mobile communication device in the distance less than 10 cm. At this distance is the data carrier energetically supplied contact-free by the electromagnetic field of the mobile communication device. The data carrier receives the requiring order, evaluates it and according to the recognized requiring order chooses from its memory appropriate file with a sequence of keyboard orders. The data carrier encodes this file and subsequently sends to the mobile communication device where the file with a sequence of keyboard orders is decoded and later a process representing keystrokes according to the sequence of keyboard orders are performed. Transmission of the requiring signal is, from the physical point of view, made of electromagnetic field transformed by the data carrier into electric power which energizes the circuits of the data carrier. Due to this, the data carrier receives the requiring order, evaluates it and assesses which of the saved files with a sequence of keyboard orders corresponds with the required order where for example file indexing may be used.

To increase the level of security it is advantageous when the requiring order is encoded before sent from the mobile communication device and the data carrier decodes and subsequently evaluates the requiring order after its receiving.

The mobile communication device and the data carrier can be matched and the data carrier joint in to the communication link firstly recognizes appropriateness of the

mobile communication device and/or the mobile communication device recognizes appropriateness of the data carrier. Appropriateness can be recognized due to a unique identifier of the assigned data carrier, possibly the mobile communication device. Such configuration ensures the uniqueness of the communication pair and eliminates situations in which an unsuitable data carrier attempts to communicate with the mobile communication device, for example when trying to transmit and perform undesirable macro files.

For purpose of increasing a higher level of security mainly at the payment transactions, before sending the requiring order, the mobile communication device can ask for entering the correct identifier on the keyboard, preferably PIN code. This proceeding reduces the possibility to send the requiring orders of a stolen mobile communication device, f.e. in aim to break the cryptography.

The file with a sequence of keyboard orders needs to be stored into the memory of the data carrier before its first use. File with a sequence of keyboard orders is into the data carrier stored and/or rewritten via mobile communication device where the transmission is encoded and the mobile communication device includes appropriate software to create the macro files. When recording file with a sequence of keyboard orders the data carrier will be placed near the mobile communication device and transmission of macro file is basically opposite to the transmission and realization of macro file in mobile communication device.

Disadvantages mentioned in the Present Technology Status are eliminated significantly by connection to perform repeated operations on the keyboard of a mobile communication device, principally a mobile phone at direct debits using a sequence of keyboard orders of a macro type by which, the above described method according to this invention is performed and the bottom line of which is that the separate data carrier with memory is connected to the mobile communication device via contact-free communication link. The data carrier also includes a processor, transmitting and receiving unit to communicate with the mobile communication device and a block for transforming electromagnetic field into electric energy. Processor is connected to the memory and also with the transmitting and receiving unit to communicate with the mobile communication device. The components of the data carrier are supplied from

the block for transforming electromagnetic field into electric energy. Block of transformation will process the energizing from the electromagnetic field and will mainly be a part of the transmitting and receiving unit of which aerial can be possibly used. The mobile communication device includes a block for processing a file with a sequence of keyboard orders and transmitting and receiving unit for connection into the communication link.

The data carrier is switched to operate by creating electric energy in the block for transforming electromagnetic field of the mobile communication device. Subsequently it can receive and process orders, external data. The data carrier recognizes the appropriateness of the mobile communication device and its received signal decodes, evaluates and reacts by means of choosing the relevant file with a sequence of keyboard orders. To supply energetic need of the data carrier, the data carrier must be located during the operation near the mobile communication device.

In terms of technological compatibility it is advantageous if the mobile communication device is a mobile phone with NFC communication unit.

The subject of this invention is also the data carrier itself, which enables to perform repeated operations on the keyboard of the mobile communication device, mainly a mobile phone at direct debits using the sequence of keyboard orders of a macro type according to this invention, of which the bottom line is that it consists of a processor, transmitting and receiving unit to communicate with the mobile communication device, a block for transforming electromagnetic field into electric energy and a memory to store at least one file of orders. Transmitting and receiving unit and the block for transforming electromagnetic field into electric energy are connected with a processor which is also connected to the memory. Such configuration allows the data carrier, which is approached to the mobile communication device to use the energy of the device and to transform it to electric energy to supply the data carrier components. In advantageous configuration, activated data carrier recognizes the appropriateness of the mobile communication device and receives the requiring order according to which it performs the tasks in the required way.

Utility attributions increase a configuration where the data carrier also contains a component to accumulate electric energy connected with the block for transforming

electromagnetic field into electric energy. This component is used for short-term accumulation of electric energy, for energy supply of data carrier circuit during one operation by which is ensured the stabilization of performed processes, also in case of impaired receiving of the electromagnetic field.

It is advantageous if the data carrier includes NFC chip and the data carrier is located in a pendant and/or key ring and/or a sticker and/or a tab.

Invention allows using energetically passive data carrier which is able to process actively, mainly to encode the file with a sequence of keyboard orders of a macro type. The main advantage is a higher security level by preserving user's comfort. This particular energetic passivity enables to reduce the size of the data carrier since no use of own energy source is needed and also user's comfort is increased since the user does not take care of charging or the condition of the data carrier. More macro files can be stored into the data carrier memory.

The components of the data carrier are energetically supplied from electromagnetic field of the mobile communication device either directly by at that time gained energy, or partly by energy accumulated during the state of approach to the mobile communication device at the appropriate macro file transmitting operation.

The invention enables to increase safety and comfort of data entering. At the same time, the invention accelerates the course of the direct debit when the mobile communication device substitutes keystrokes in a set order in a significantly faster mode than the user is able to enter on the keyboard manually.

DESCRIPTION OF DRAWINGS

The invention is described in more details by means of pictures 1 and 2, where picture 1 shows the connection scheme of a mobile communication device and a data carrier at the cashless transaction.

Picture 2 represents the scheme of data carrier components to store and transmit a file with a sequence of keyboard orders.

EXAMPLE OF APPLICATION

In this example the connection consists of a mobile communication device 2 represented by a mobile phone NOKIA 6131 serially equipped by NFC technology and a data carrier 1 located in a key ring.

The mobile communication device 2, in described situation functions similarly as a payment card in such way that in the memory is a software application enabling to realize payments in cooperation with the payment terminal. In the mobile communication device 2 the user, after the application starts has to enter the account number from which at that time activated payment should be realized. The user chooses from the menu of the mobile communication device 2 the selected account. The process of entering the identifying data to the selected account is done in such way, that the user by entering the correct PIN code in the mobile communication device 2 starts a process of requiring a file with sequence of keyboard orders – macro file. Requiring order is encoded and transmitted via transmitting and receiving unit of the mobile communication device 2.

After entering PIN code, the user approaches the key ring which represents the data carrier 1 closer to the mobile communication device 2 by which a contact-free communication link 3 will be made. Electromagnetic field will energize the block 7 for transforming electromagnetic field in the data carrier 1 and the arisen electric energy will supply the components of the data carrier 1. The requesting order is decoded and evaluated in the processor 4 of the data carrier 1. In accordance with the evaluation, the appropriate file with a sequence of keyboard orders which represent the keystrokes in order defining compete identification of the chosen account is selected from the memory 5 placed in data carrier 1 . The file with a sequence of keyboard orders will be encoded in data carrier 1. Subsequently, the encoded file is transmitted from data carrier 1 via transmitting and receiving unit 6 into the mobile communication device 2 where it is decoded and used as a common macro file obtained from the keyboard.

Due to its connection, data carrier 1 can also function for payment authenticity and confirmation since from the hardware point of view, it is able to do computing

operations which enable encoding and decoding needed for electronic signature realization.

INDUSTRIAL APPLICABILITY

Industrial applicability is obvious. According to this invention, it is possible to enter a sequence of keyboard orders through a separate data carrier with a memory.

According to this invention it is also possible to produce, connect and use passive data carrier, principally by using NFC chip standards where the source, according to this invention, may be supplied by the electromagnetic field of the mobile communication device.

LIST OF RELATED SYMBOLS:

1- data carrier

2- mobile communication device

3- communication link

4- processor

5- memory

6- transmitting and receiving unit

7- block of transformation

PATENT CLAIMS

1. Method of realization repeated operations on the keyboard of a mobile communication device, principally a mobile phone, at direct debits using a sequence of keyboard orders of a macro type is characterized by the fact that used is a separate data carrier (1) with a memory (5) in which at least one file with a sequence of keyboard orders is stored where the data carrier (1) and the mobile communication device (2) are connected via contact-free communication link (3) and a file with sequence of keyboard orders is transmitted into a mobile communication device (2).

2. Method of realization repeated operations on the keyboard of a mobile communication device according to claim 1 is characterized by the fact that the requiring order is sent via contact-free communication link (3) from the mobile communication device (2) into the data carrier (1) approached to the mobile communication device (2), preferably in the distance less than 10 cm; data carrier (1) is energetically supplied contact-free by electromagnetic field of the mobile communication device (2), data carrier (1) receives the requiring order and according to this order chooses from the memory (5) and encodes appropriate file with a sequence of keyboard orders, subsequently the data carrier (1) sends the encoded file with sequence of keyboard orders into the mobile communication device (2) where the received file with sequence of keyboard orders will be decoded and where the processes representing the keystrokes according to the sequence of keyboard orders will be performed.

3. Method of realization repeated operations on the keyboard of a mobile communication device according to claim 1 or 2 is characterized by the fact that the requiring order is encoded before sent from the mobile communication device (2) and the data carrier (1) decodes the order after its receiving.

4. Method of realization repeated operations on the keyboard of a mobile communication device according to any of the claims 1 to 3 is characterized by the fact that the mobile communication device (2) and the data carrier (1) are matched and the data carrier (1) joint in to the communication link (3) firstly recognizes appropriateness of the mobile communication device (2) and/or the mobile communication device (2) recognizes appropriateness of the data carrier (1).

5. Method of realization repeated operations on the keyboard of a mobile communication device according to any of the claims 1 to 4 is characterized by the fact that before sending the requiring order, the mobile communication device (2) asks for entering the correct identifier on the keyboard, preferably PIN code.

6. Method of realization repeated operations on the keyboard of a mobile communication device according to any of the claims 1 to 5 is characterized by the fact that the file with a sequence of keyboard orders is into the data carrier (1) stored and/or rewritten via mobile communication device (2) where the transmission is encoded and the mobile communication device (2) includes appropriate software.

7. The connection to perform repeated operations on the keyboard of a mobile communication device, principally a mobile phone at direct debits using a sequence of keyboard orders of a macro type is characterized by the fact that the separate data carrier (1) with memory (5) is connected to the mobile communication device (2) via contact-free communication link (3); the data carrier (1) also includes a processor (4), transmitting and receiving unit (6) to communicate with the mobile communication device (2), block (7) for transforming electromagnetic field into

electric energy where the processor (4) is connected to the memory (5) and also with the transmitting and receiving unit (6) to communicate with the mobile communication device (2), the components of the data carrier (1) are energetically supplied from the block (7) for transforming electromagnetic field of the mobile communication device (2) and the mobile communication device (2) a block for processing a file with a sequence of keyboard orders and a transmitting and receiving unit for connection into the contact-free communication link (3).

8. The connection to perform repeated operations on the keyboard of a mobile communication device according to claim 7 is characterized by the fact that the mobile communication device (2) is a mobile phone with NFC communication unit.

9. Data carrier to perform repeated operations on the keyboard of a mobile communication device, principally a mobile phone at direct debits using a sequence of keyboard orders of a macro type is characterized by the fact that it consists of a processor (4), transmitting and receiving unit (6) to communicate with the mobile communication device (2), a block (7) for transforming electromagnetic field into electric energy and a memory (5) to store at least one file with a sequence of keyboard orders where the transmitting and receiving unit (6), preferably with the block (7) for transforming electromagnetic field into electric energy are connected with a processor (4) which is also connected to the memory (5).

10. Data carrier to perform repeated operations on the keyboard of a mobile communication device according to claim 9 is characterized by the fact that it includes NFC chip.

11. Data carrier to perform repeated operations on the keyboard of a mobile communication device according to claim 9 or 10 is characterized by the fact that it includes a component for electric energy accumulation connected with the block (7) for transforming electromagnetic field into electric energy.

12. Data carrier to transmit the performance of repeated operations on the keyboard of a mobile communication device according to any of the claims 9 to 11 is characterized by the fact that it is located in a pendant and/or key ring and/or a tab and/or a sticker.

AMENDED CLAIMS
received by the International Bureau on 05 September 2009 (05.09.2009)

1. Method of realization repeated operations on the keyboard of a mobile communication device, principally a mobile phone, namely at direct debit applications using a sequence of keyboard orders of a macro type and including entering of identifying data of mean of payment into mobile communication device is characterized by the fact that used is a separate data carrier (1) identificationally paired with mobile communication device (2), data carrier has a memory (5) in which at least one file with a sequence of keyboard orders with respective identifying data of mean of payment is stored, where the mobile communication device (2) and data carrier (1) approached to it are connected via contact-free communication link (3) by which the requiring order is sent the mobile communication device (2) into the data carrier (1) in the distance less than 10 cm, data carrier (1) receives the requiring order and according to this order chooses from the memory (5) and encodes appropriate file with a sequence of keyboard orders with respective identifying data of mean of payment, subsequently the data carrier (1) electronically signs and then sends the encoded file with sequence of keyboard orders into the mobile communication device (2) where the received file with sequence of keyboard orders will be decoded where the processes representing the keystrokes according to the sequence of keyboard orders with addition of identifying data of mean of payment into debit application, while the data carrier (1) is in order to execute these tasks is energetically supplied contact-free by electromagnetic field of the mobile communication device (2).

2. Method of realization repeated operations on the keyboard of a mobile communication device according to claim 1 is characterized by the fact that the requiring order is encoded before sent from the mobile communication device (2) and the data carrier (1) decodes the order after its receiving.

3. Method of realization repeated operations on the keyboard of a mobile communication device according to any of the claims 1 to 2 is characterized by the fact that the mobile communication device (2) and the data carrier (1) are matched and the data carrier (1) joint in to the communication link (3) firstly recognizes appropriateness of the mobile communication device (2) and/or the mobile communication device (2) recognizes appropriateness of the data carrier (1).

4. Method of realization repeated operations on the keyboard of a mobile communication device according to any of the claims 1 to 3 is characterized by the fact that before sending the requiring order, the mobile communication device (2) asks for entering the correct identifier on the keyboard, preferably PIN code.

5. Method of realization repeated operations on the keyboard of a mobile communication device according to any of the claims 1 to 4 is characterized by the fact that the file with a sequence of keyboard orders with respective identifying data of mean of payment is into the data carrier (1) stored and/or rewritten via mobile communication device (2) where the transmission is encoded and the mobile communication device (2) includes appropriate software.

6. The connection to perform repeated operations on the keyboard of a mobile communication device, principally a mobile phone namely at direct debits using a sequence of keyboard orders of a macro type including entering of identifying data of mean of payment into mobile communication device is characterized by the fact that the mobile communication device (2) is through NFC communication link (3) connected with the identificationally paired separate data carrier (1); the data carrier (1) also includes memory (5), a processor (4), transmitting and receiving unit (6) to

communicate with the mobile communication device (2), block (7) for transforming electromagnetic field into electric energy where the processor (4) is connected to the memory (5) and also with the transmitting and receiving unit (6) to communicate with the mobile communication device (2), the components of the data carrier (1) are energetically supplied from the block (7) for transforming electromagnetic field of the mobile communication device (2), data carrier (1) is equipped with a block of encoding and decoding of processed data and the mobile communication device (2) is equipped with a block for processing a file with a sequence of keyboard orders with respective identifying data of mean of payment and a transmitting and receiving unit (6) for connection into the contact-free communication link (3).

7. Data carrier to perform repeated operations on the keyboard of a mobile communication device, principally a mobile phone namely at direct debits using a sequence of keyboard orders of a macro type and including entering of identifying data of mean of payment into mobile communication device or POS is characterized by the fact that it consists of a processor (4) for processing of received and transmitted data, especially in form of encoding and decoding data and electronic signing of files with identifying data of mean of payment, while data carrier (1) is externally energetically passive, includes NFC transmitting and receiving unit (6) to communicate with the mobile communication device (2) or POS, a block (7) for transforming electromagnetic field into electric energy and a memory (5) to store at least one file with a sequence of keyboard orders with respective identifying data of mean of payment where the transmitting and receiving unit (6) and the block (7) for transforming electromagnetic field into electric energy are connected with a processor (4) which is also connected to the memory (5).

8. Data carrier to perform repeated operations on the keyboard of a mobile communication device according to claim 7 is characterized by the fact that it includes a component for electric energy accumulation

connected with the block (7) for transforming electromagnetic field into electric energy accumulated during an actual state of approach of data carrier (1) to mobile communication device (2).

9. Data carrier to transmit the performance of repeated operations on the keyboard of a mobile communication device according to any of the claims 7 or 8 is characterized by the fact that it is located in a pendant and/or key ring and/or a tab and/or a sticker.

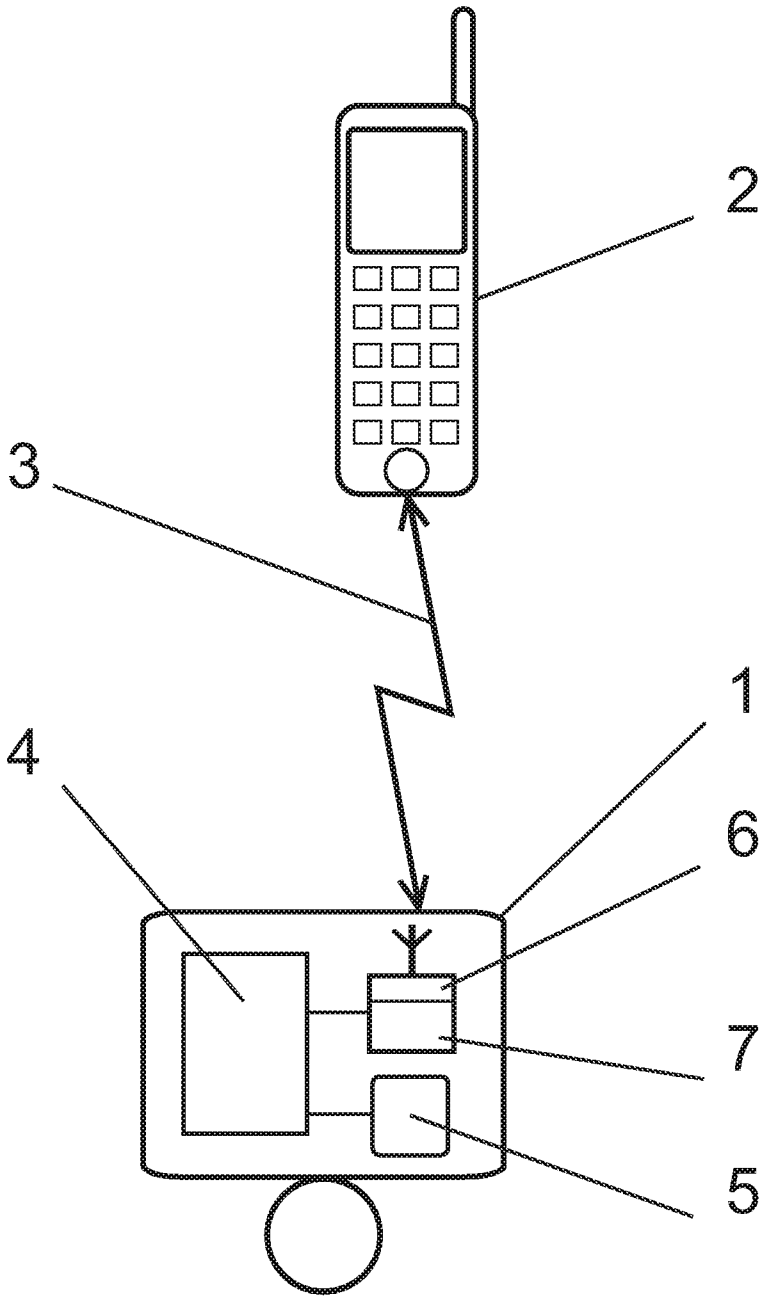

Fig. 1

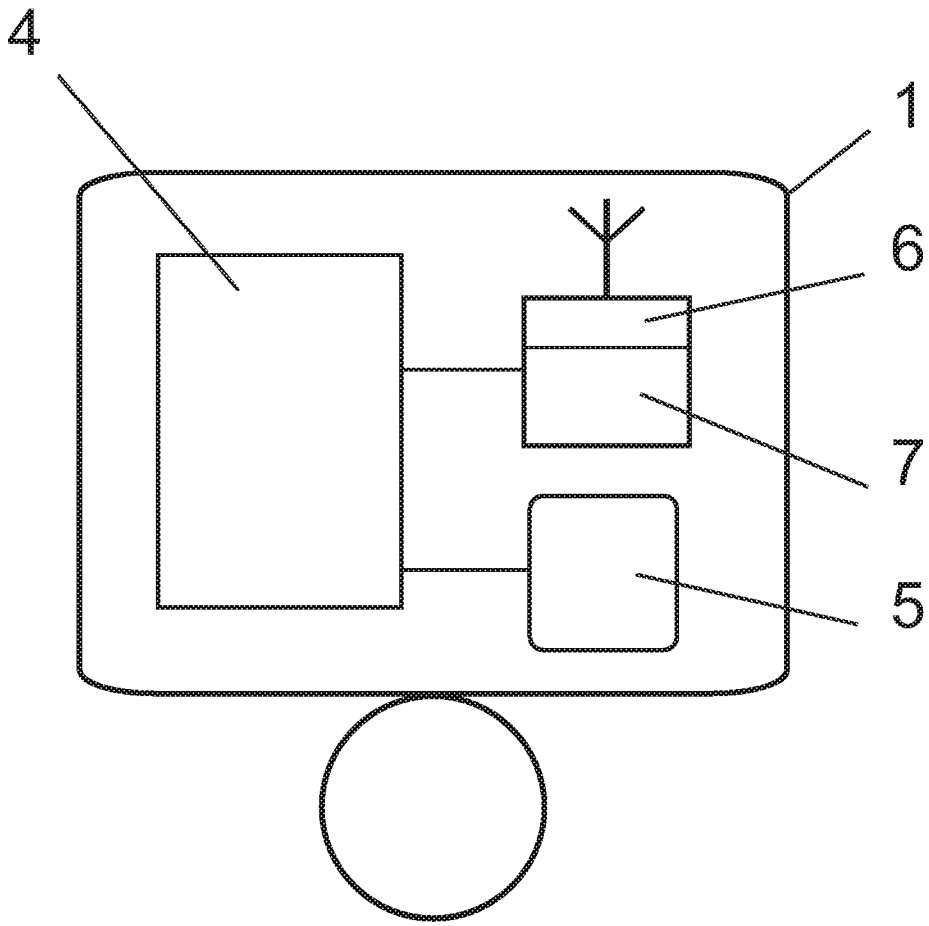

Fig. 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2009/051212

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06Q20/00 G06K7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06Q G06K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/125745 A1 (ENGESTROM JYRI [FI] ET AL ENGESTROEM JYRI [FI] ET AL) 9 June 2005 (2005-06-09) cited in the application the whole document	1-12
A	FINKENZELLER KLAUS: "RFID-Handbuch: Grundlagen und praktische Anwendungen induktiver Funkanlagen, Transponder und kontaktloser Chipkarten: 8. Datensicherheit" RFID HANDBOOK: GRUNDLAGEN UND PRAKTISCHE ANWENDUNGEN, XX, XX, 1 January 2002 (2002-01-01), pages 225-231, XP002320357 the whole document	1-12

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 June 2009	06/07/2009

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Van Dop, Erik

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2009/051212

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SMART CARD ALLIANCE: "Proximity Mobile Payments: Leveraging NFC and the Contactless Financial Payments Infrastructure A Smart Card Alliance Contactless Payments Council White Paper" INTERNET CITATION, [Online] 1 September 2007 (2007-09-01), page complete, XP007906262 Retrieved from the Internet: URL:http://www.smartcardalliance.org> [retrieved on 2008-11-07] figure 5 -----	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2009/051212

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005125745 A1	09-06-2005	CN 101366043 A	11-02-2009
		EP 1695172 A2	30-08-2006
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		JP 4268640 B2	27-05-2009
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