(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 February 2012 (02.02.2012)

PCT

(10) International Publication Number
WO 2012/014185 A1

(51) International Patent Classification:
*G06Q 20/00* (2012.01)

(21) International Application Number:
PCT/IB2011/053395

(22) International Filing Date:
29 July 2011 (29.07.2011)

(25) Filing Language: Slovak

(26) Publication Language: English

(30) Priority Data:
PP 50034-2010 30 July 2010 (30.07.2010) SK

(72) Inventor; and
(71) Applicant : **HUBINÁK, Emil** [SK/SK]; Beethovenova 4, 921 01 Piešťany (SK).

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

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17**:

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

*[Continued on next page]*

(54) Title: SYSTEM AND METHOD OF CASHLESS PAYMENT FOR PURCHASE OVER A TELEVISION CHANNEL

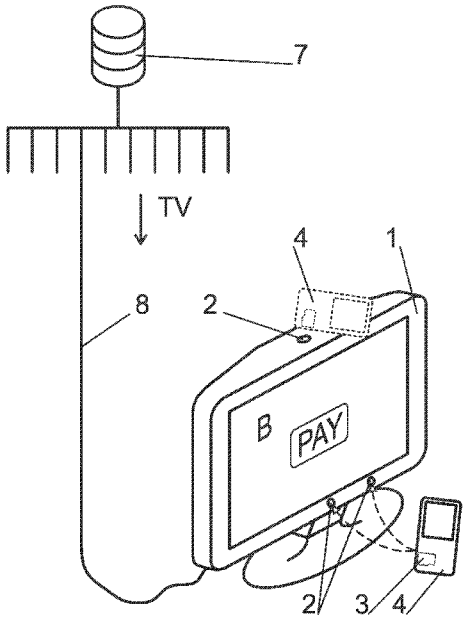


Fig. 3

(57) Abstract: A display unit (1), e.g. in the form of a television receiver is equipped with an NFC reader (2), the signal of which is available on the display unit (1) body surface. A payment in the form of an on-line or an off-line payment for the item being purchased (5) that is displayed on the display unit is confirmed by at least one tap of the mobile communication device (4) to the display unit (1). A POS payment-terminal application, preferably of the EMV standard, runs on a removable memory card (3) inserted in the slot of a mobile communication device (4); the resulting payment cryptogram is sent to the display unit (1), from where it is sent to be processed in the center (7) over the connection (8) for the reception of the TV signal. The NFC communications element on the side of the mobile communication device (4) can be located on the removable memory card (3) or even directly on the PCB board.

WO 2012/014185 A1

— *of inventorship (Rule 4.17(iv))*

**Published**:

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

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

# System and method of cashless payment for purchase over a television channel

## Technology

The invention refers to an integration of a display unit, such as a television receiver, into a cashless payment system, in which items being bought are offered for sale over a television channel and where a mobile communication device, such as a mobile phone, is used to make payments. The invention also describes how cashless payments are made and confirmed using a contactless transmission connection. Several elements of this invention are tied to advantages arising from technical solutions included in previous patent applications SK PP 58-2008 from August 29th, 2008, PP 50014-2009 from March 12th, 2009 (antenna on an SD card), SK PP 32-2009 from May 3rd, 2009 (EMV terminal on an SD card), SK PP 50016-2010 from April 19th, 2010 (Payment Button).

## Present technology

There are published patent applications which deal with the function of a television receiver and its configuration for the purposes of selling goods and services, and also for paying for them. The entire group of patent applications as are e.g. US 2004/0249726 A1, CN 101308558, CN 101296361 (A), FR 2810132 (A1) describe a process during which various business items, goods or services appear on the television receiver and the customer selects the item he wants to purchase in a similar way as if selecting it from a paper catalogue. However, the payment process that follows the selection of the item is beyond the television receiver and usually a specific identifier of the item being purchased is used. For the subsequent payment process some systems use a phone– or a mobile phone – in various ways e.g. sending an SMS message with the identifier. These known solutions do not offer a secure and comfortable payment channel and they often require a pre-registration of a phone in a given business network.

In solution according to the published application WO 2009071616(A1), GEMALTO uses a SIM card that is connected to a television receiver. This kind of solution requires a complicated interface, sufficient security on the side of a television receiver and also complicated operating procedures. Similar limitations and problems are connected with the solution according to the published applications CN 1625257A, CN 2747809 (Y), in which a special remote control having a payment card magnetic stripe reader is used.

The solution according to the patent EP 1263230B1 (VISA) uses a payment smart card reader which must be connected to a special set-top box.

At this point in time there are no technical devices enabling the creation of a payment application system element from a TV receiver in a secure and simple way that also has the security required by individual participants of the entire business process (a payment card issuer, a processing center, a bank, a merchant).

Such a technical solution is required that would include the high security of the EMV payment application and that will generate resulting payment cryptograms in the form of EMV standards. At the moment this kind of solution is not known or known solutions have security risks based on the fact that during the data transmission from the paying customer´s payment card into a remote POS terminal or to the merchant´s virtual POS terminal, the data can be disclosed and misused.

## The subject matter of the invention

The deficiencies mentioned are to a large extent eliminated by a cashless payment system that uses a display unit, such as a television (TV) receiver and a mobile communication device, such as a mobile phone with an NFC (Near Field Communication) communication element according to this invention – the subject matter of which is based on the fact that the display unit is equipped with a NFC (Near Field Communication) reader that is connected to the display unit output interface directly or through an evaluation unit; the output interface is connected to the center.

The display unit will be, above all, a TV receiver, which is basically in every home; however the display unit is not limited to a TV receiver. The display unit in question can also be in the form of a monitor that displays a television signal from the receiving set box in an already processed way.

The NFC reader is accessible from the outside; it is placed in a commonly accessible position. It can be located under the screen frame on the upper edge or in some similar position. The display units that have e.g. an USB connector can get NFC connectivity by inserting an external USB key with a NFC reader into a USB connector. In this way it will be possible to equip even older TV receiver's with an NFC reader. The NFC reader is, but is not limited to, a communication element on the RFID basis (Radio-frequency identification) where the reader can be capable not only of reading NFC/RFID tags within a corresponding range; nevertheless under the NFC reader term we need to understand in general a transmitting and receiving device that in our case is an antenna located in such a way that it is able to communicate with devices that approach the display unit from the outside.

The implementation of the NFC reader into the display unit enables the creation of a bilateral contactless communication channel with external devices, even with a mobile communication device, such as a mobile phone, PDA (Personal digital assistant), tablet or other similar devices can be part of the payment system described herein. The mobile communication device is equipped with an NFC communication element. It can be either a NFC communication element embedded directly on a PCB (printed circuit board) board or it can be a mobile communication device with a slot in which is inserted a removable memory card with the NFC communication element. In our case, this slot is designed for technical devices without which the mobile communication device can fulfill its basic function; so the slot in question does not influence the transmission of data and/or voice in the mobile operator's network which makes it different from the interface for SIM (subscriber identity module) card. The removable memory card which is described in this solution does not depend on the mobile phone's SIM card and it can be inserted into and removed from the mobile phone without interrupting the mobile phone's common functions.

From the point of view of simple implementation into business practice it would be suitable if the NFC communications element on the side of the mobile communication device was located on a removable memory card which also contained the antenna. On the removable memory card there can be a POS (point of sale) payment terminal and also one or more payment cards. A payment device held by a user is created by inserting this kind of removable memory card with two independent Secure Elements into the mobile communication device .

The user will select the item he wants to buy over a display unit. In this way the user can rent a film, he can get an electronic file or even some goods that will be then sent to him through a courier or the item being purchased can even be a service. When selecting the item, the user can use the display unit´s - TV receiver´s - remote control. After the selection of the item, the user is asked to pay the corresponding amount. In the mobile communication device´s menu the user launches the payment application that activates the NFC communications element and that makes the payment devices on the removable memory card accessible. The payment is realized after the mobile communication device is tapped to the display unit´s NFC reader. The subject of the required protection is also the way of payment itself. For this way of payment it is typical that the payment is confirmed at least by one tap of the mobile communication device to the display unit, which is namely in the form of a TV receiver.

The payment terminal along with corresponding configuration data can be placed to the removable memory card, meaning that the process kernel of the POS terminal can be on the removable memory card and the run of all inter payment – terminal applications could take place on the removable memory card. The placement of the POS terminal into the mobile communication device that is held by the paying user brings along new technical and business advantages; however the mobile phones do not have payment card readers. Therefore it would be suitable if even the user´s payment card or several payment cards were be on the same hardware device – on the removable memory card. Technically, this could be assured by the removable memory card having both a secured part of the memory with data for the payment terminal and a separate memory part with payment card data.

In the configuration proposed it is possible to use several different payment processes both in the case of an online payment and in the case of an offline payment. After the user taps his mobile communication device to the NFC reader on the display unit, the information about the required payment amount is transferred into the POS terminal on the removable memory card and the payment can take place only with one tap, e.g. in the form of the offline payment under a limit such as USD 20. The NFC reader can be placed in such a way so the user could place his mobile communication device on the NFC reader without having to hold it during payment. In case the processing and the data transmission is sufficiently fast then only a short tap of the mobile communication device would suffice.

It is also possible to have a process in which the payment is realized in several steps that can be separated even by taking the mobile communication device from the reach of the NFC reader. The division of the payment into several steps, e.g. two taps with the mobile communication device enables the user to verify whether the amount going into the payment terminal as an input is the same as the amount displayed during selection on the display unit. This will increase the trust of the users even when realizing a purchase in foreign currency e.g. in hotels, public places, one-purpose business terminals and similar. In that case the user can select the payment card even in the second step of the payment process.

In both cases, the important feature is the fact that the payment cryptogram is being created within the mobile communication device's circuits, such as on the removable memory card and after that the payment cryptogram is sent into the NFC reader of the display device. If the communication that takes place during generation of a payment cryptogram between a payment card and a POS terminal, is narrowed to transmit data within one hardware device in the mobile phone then it is not possible to monitor/misuse this communication by using common tools without having permission. After the payment is realized, the encrypted information about the realized payment is being transferred from the removable memory card; this information is secured sufficiently in accordance with the EMV (Europay MasterCard VISA) standard. A payment cryptogram is sent to the display unit and subsequently to the center- this

cryptogram can be read and processed in the corresponding bank in accordance with commonly used standards. This brings the advantage of processing the payment in the center or bank as if it was a payment on a standard POS terminal in a physical shop.

So, the solution presented here enables to establish a connection between a personalized payment device held by the user himself with an NFC reader in a display unit that will be generally accessible.

POS payment terminal sensitive data, such as encryption keys and identification data, must be stored in a protected part of the memory, preferably in so-called Secure Element, which has preset hardware features and receives a certification, thanks to which the corresponding parties are willing to store its sensitive data into these memory tools.

**Pictures overview**

The invention is explained in more detail in figures 1 to 3. In figure 1 there is a display unit in the form of a television receiver where one can select a purchase page using a remote control and subsequently select the required item. The figures include examples of several locations on the television receiver in which the NFC reader could be placed. In reality one NFC reader on the outside surface might be enough, possibly it can also be placed as an external reader connected to the display unit.

Figure 2 shows a removable memory card with a NFC antenna that is inserted in a mobile phone. The displayed size ratio of the removable memory card and the mobile communication device is not subject to protection – the figure is not shown in actual scale; its task is to increase clarity of depiction and therefore it does not narrow the protection scope of this invention.

In figure 3 there is a scheme displaying the connection between the center and the TV receiver to which the mobile communication device is approached during the payment process.

**Realization examples**

In this example according to figures 1 to 3 there is a description of a system with a display unit 1 , which is in the form of a flat television receiver. An NFC reader 2 antenna is located next to the upper edge of the receiver's plastic body and also on the front side of the frame. The placement of the antenna on the surface is marked with a green LGM (Logomotion) logo. The antenna is connected to a processing unit on a PCB board of the display unit 1. The output of this processing unit is interconnected with the interface through which the display unit 1 receives the TV signal. This one can be received over a cable or even wirelessly. A mobile communication device 4 without its own NFC communications element is used in the system. This element along with the NFC antenna is located in the removable memory card 3, which in this example is of the microSD card format. An indifferent POS payment terminal and independent domains with payment cards of the EMV standard are located in two Secure Elements on the microSD card. After configuration, the indifferent POS payment terminal becomes a payment terminal of a specific bank's payment processor. The removable memory card 3 has also a common flash memory for common, unprotected user data.

Before the payment, the user inserts the removable memory card into the micro SD slot in the mobile communication device 4, which is shown on figure 2. Using the remote controller 6 the user selects the item he wants to purchase on the display unit 1. In this case it is the B item – rent a movie. Then using the remote controller 6 the user confirms the selection and the request for the payment of the selected item B is displayed on the display unit 1.

The connection according to this example enables on-line or even off-line payments. In case of off-line payments, which have the payment amount limit set by a card issuer, or by the bank, the payment is made by one tap of the mobile phone 4 to the TV receiver 1. The user taps the green LGM logo with his mobile communication device 4, to which the display unit 1 sends the initialization request with the requested payment amount. The payment process runs in the POS terminal on the removable memory card and it results in an off-line payment cryptogram as if it was a common

off-line payment between a standard POS terminal held by a merchant and a payment card of a paying user. When the mobile phone 4 is tapped to the TV receiver 1, the payment cryptogram is sent to the NFC reader for further processing in the center 7.

In another case, the online payment can be carried out with two taps of the mobile communication device 4. The reception of the initialization request for payment from the NFC reader 2 to the removable memory card 3 in this example, displays the requested payment amount on the display of the mobile communication device 3. The user can check the amount of the requested payment. Subsequently, the respective payment-terminal application is run in a way as if it was a relationship between a common POS payment terminal and a payment card which is inserted in the POS terminal's reader. On the Secure Element there are stored the POS terminals' configuration data belonging to several persons, among others of the TV store operator. After the activation of the payment application its run can also be controlled by risk management rules set by the respective payment issuer. According to this the payment card's password either will have to be entered or not. The user presses the payment purpose button with which the mobile communication device 4 is equipped in this example.

After the payment-terminal application is ended, the connection between the POS payment terminal and the payment card is disconnected on the software level and the resulting payment cryptogram must be sent over the connection 8 to the center 7, then the user taps the mobile communication device 4 to the NFC reader 2 on the display unit 1 for the second time. After the reception and decryption of the payment file in the center 7, the cryptogram is evaluated and in case of a positive result the rented film paid for is sent to the display unit 1.

**Industrial usability**

The industrial usability is obvious. According to this invention it is possible to make and confirm payments by tapping a mobile phone to a TV receiver. The display units with a NFC reader can be industrially and repeatedly produced and used. Above

all, these will be used to make cashless payments connected with mobile communication devices.

List of relating symbols

1- display unit

2- NFC reader

3- removable memory card

4- mobile communication device

5- item being purchased

6- remote controller

7- center

8- connection

NFC - Near Field Communication

EMV - Europay MasterCard VISA

RFID - Radio-frequency identification

PCB - printed circuit board

PDA - personal digital assistant

SIM - subscriber identity module

POS – point of sale

TV – television receiver

...

# PATENT CLAIMS

1. A cashless payment system for purchases over a television channel using an independent display unit, such as a TV receiver, a mobile communication device, such as a mobile phone is characterized by the fact that a display unit (1) is equipped with a NFC reader (2) with an antenna signal available from outside; the NFC reader (2) is connected to a display unit (1) output interface directly or over a processing unit in order to receive a TV signal; the output interface is connected to a center (7) through a connection (8) and the mobile communication device (4) is equipped with a NFC communication element and a payment device.

2. A cashless payment system according to the claim 1 is characterized by the fact that the mobile communication device (4) encompasses a removable memory card (3), which has a NFC communication element with an antenna for the establishment of a contactless connection.

3. A cashless payment system according to the claims 1 or 2 is characterized by the fact the mobile communication device (4) encompasses a removable memory card (3), on which there is a unit for the run of a POS payment terminal application and a secured memory with at least on payment card unit.

4. A way of a cashless payment for purchases over a television channel with a display unit (1) , using a mobile communication device (4) is characterized by the fact the payment is made and/or confirmed by at least one tap of the mobile communication device (4) to the display unit (1).

5. A way of a cashless payment for purchases over a television channel according to the claim 4 is characterized by the fact that the amount being paid is

displayed on the mobile communication device's (4) display, where the amount is confirmed or the amount is confirmed by one tap or repeated tap of the mobile communication device (4) to the display unit (1).

6. A way of a cashless payment for purchases over a television channel encompassing a selection of the amount being paid (5) and a payment using a mobile communication device is characterized by the fact the item being purchased (5) is selected and displayed on a display unit (1); the required payment amount is sent to the approached mobile communication device (4) over the NFC reader (2); the POS payment terminal application runs within the mobile communication device (4), preferably on the removable memory card (3); the result of which is sent to the NFC reader (2) in the display unit (1) and subsequently to the center (7) in the form of a payment cryptogram.

7. A way of a cashless payment for purchases over a television channel according to any of the claims 4 to 6 is characterized by the fact the item being purchased (5) is selected using a remote controller (6).

8. A way of a cashless payment for purchases over a television channel according to any of the claims 4 to 7 is characterized by the fact that the payment cryptogram is generated in the form of an on-line cryptogram or an off-line cryptogram within the mobile communication device's (4) circuits, preferably on the removable memory card (3) inserted in the slot of the mobile communication device (4).

9. A way of a cashless payment for purchases over a television channel according to the claim 8 is characterized by the fact that the payment cryptogram is generated in a POS terminal after an indifferent POS terminal is configured to a specific recipient's POS terminal; the POS terminal communication with the

selected payment card located within the mobile communication device's (4) circuits, preferably on the removable memory card (3).

10. A way of a cashless payment for purchases over a television channel according to any of the claims 4 to 9 is characterized by the fact that on the basis of the EMV standard the center (7) evaluates the payment cryptogram, directly or over a connection to the payment card's issuer and depending on the result the request to decline or confirm the purchase of the item being purchased (5) is sent to the display unit (1) over the connection (8).

...

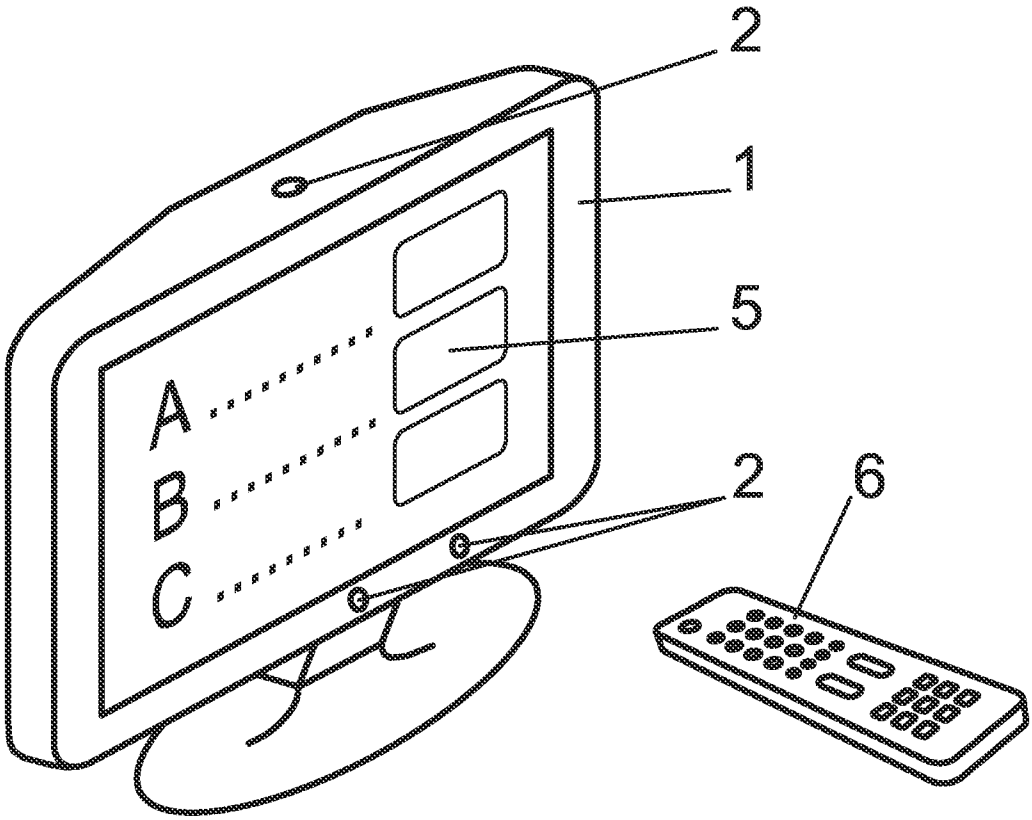


Fig. 1

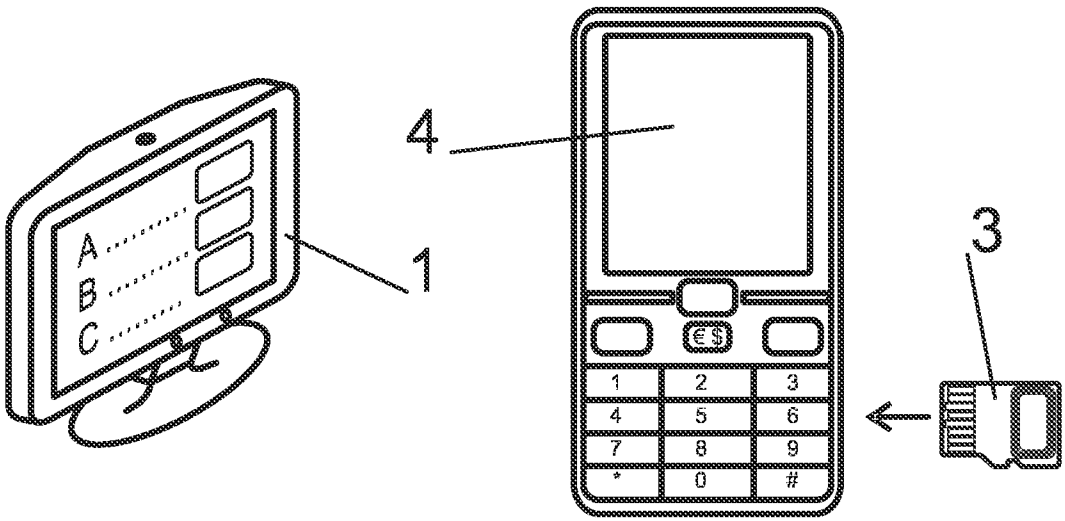


Fig. 2

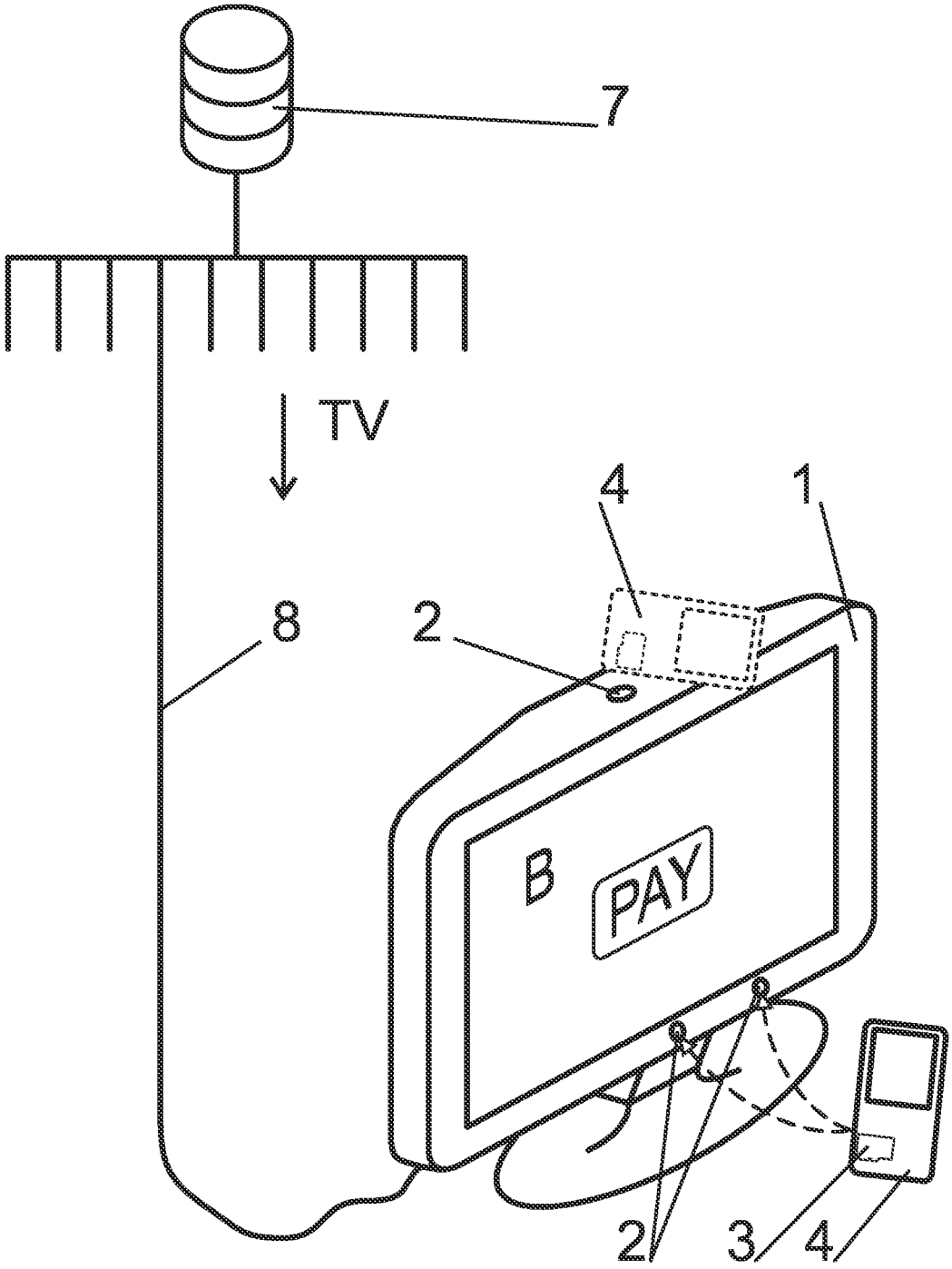


Fig. 3

# INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2011/053395

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

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | US 2008/099559 A1 (LO YING-CHE [TW] ET AL)<br>1 May 2008 (2008-05-01)<br>the whole document<br>----- | 1-10 |
| X | WO 2009/018255 A2 (MOTOROLA INC [US];<br>CHITTI SRIRAM [US]; BLACK GREG R [US])<br>5 February 2009 (2009-02-05)<br>paragraph [0024] - paragraph [0025];<br>figure 1<br>----- | 1-10 |

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 17 November 2011 | 25/11/2011 |

| Name and mailing address of the ISA/ | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040,<br>Fax: (+31-70) 340-3016 | Härdeman, David |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2011/053395

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 2008099559 A1 | 01-05-2008 | CN 101174312 A | 07-05-2008 |
| | | TW 200822582 A | 16-05-2008 |
| | | US 2008099559 A1 | 01-05-2008 |
| WO 2009018255 A2 | 05-02-2009 | US 2009037326 A1 | 05-02-2009 |
| | | WO 2009018255 A2 | 05-02-2009 |