

(12) **UK Patent Application** (19) **GB** (11) **2 406 827** (13) **A**

(43) Date of A Publication **13.04.2005**

(21) Application No: <b>0414752.6</b>	(51) INT CL <sup>7</sup> : <b>G06K 19/073 , G07F 7/10</b>
(22) Date of Filing: <b>01.07.2004</b>	(52) UK CL (Edition X ): <b>B6A AC53 AC91 AK G4H HTG H14A H2P H2T</b>
(30) Priority Data: (31) <b>0323490</b> (32) <b>10.10.2003</b> (33) <b>GB</b>	(56) Documents Cited: <b>GB 2396330 A WO 1998/012675 A2 WO 1991/013411 A1 US 5350907 A US 20020139844 A1</b>
(71) Applicant(s): <b>Afzal Muhammad Khan 355 Pershore Road, Edgbaston, BIRMINGHAM, B5 7RY, United Kingdom</b>	(58) Field of Search: UK CL (Edition W ) <b>B6A, G4H</b> INT CL <sup>7</sup> <b>A45C, B42D, G06K, G07C, G07F, H04M</b> Other: <b>EPODOC, JAPIO, WPI, Full text</b>
(72) Inventor(s): <b>Afzal Muhammad Khan</b>	
(74) Agent and/or Address for Service: <b>Afzal Muhammad Khan 355 Pershore Road, Edgbaston, BIRMINGHAM, B5 7RY, United Kingdom</b>	

(54) Abstract Title: **A secure two part smart card transaction system**

(57) An inactive card (smart card) bears only part of a code (or key) on its chip. For every transaction, to activate the card, an electronic shoe device on the card is inserted into the socket of an electronic device such as a PDA, computer, watch or mobile phone. This device has a battery operated chip loaded with the remainder of an algorithmic code (or key). This is transferred into the chip on the card to provide a complete new operational code to activate the card for use in a single transaction, each new code deleting the used one. The card may serve as a bank or credit card, an electronic passport or identity card, a travel pass, or a secure access control device in an access control system. As a separate code is used for each transaction and all important information is divided between the card and the electronic device, the card is immune to forgery.

**GB 2 406 827 A**

# **A Smart Card Transaction System that provides better security against theft and unauthorised use of payment**

## **BACKGROUND OF THE INVENTION**

The invention relates to a system comprising of two components – 1) The smart card itself, which cannot be used for financial transactions until it is activated by 2) an activating system.

The credit card companies as well as the financial companies have to bear the losses running between 3 to 4 hundred million pounds each year in UK alone. Smart cards are supposed to reduce these losses by upto 70%. Smart cards increase safety and security for financial transactions compared to the conventional cards. In the smart card a “Pin number” or a “Code number” is used to provide security. However, there are several problems with the “Pin” code. One has to remember the right “Pin No.” for each card. If one holds several cards, one occasionally gets muddled between these pin numbers. This results in confusion for users who after entering certain number of wrong codes could have their card locked from making any financial transaction until activated by the financial company.

Further, if the “Pin No.” is used frequently at the same place, it is likely to be noted by others too. Also, in internet banking and internet shopping, the risk remains that others can get hold of your card details and abuse it specially when a

transaction is monitored by a spy-ware software stored in the user's computer.

The problem is to design a conveniently held activating system, which is frequently used and cannot be lost easily.

### SUMMARY OF THE INVENTION

The inventor already submitted a patent GB 0323490.3 that specifies the invention for use of cards with battery-operated watch. The invention extends the transaction of card with watch to any processor bearing electronic device.

The invention provides a smart card transaction system consisting of two parts:

- a) A card bearing a chip (the chip on the card carrying only part of the code) and an electronic shoe device for insertion into the socket of
- b) An electronic device holding a battery operated chip or processor (such as PDA, computer, mobile phone or watch etc.) which will transfer its algorithmic code (already fed into it) to the card, thus activating the card for use, so that for every transaction, a new code will be inserted deleting the used one, thus making the card immune from forgery. To prevent loss of stored data two batteries will be lodged in the electronic device – one being operational and the other as a standby.

All important financial information (such as transactions, bank details etc) will be split between the card

and the electronic device, thus making it difficult to extract the information from the card or the electronic device separately when either of them are stolen or lost. The information will only be available through the electronic device display when the card is inserted into the electronic device.

The information kept between the card and the electronic device might be displayed in various layers of security. Some information such as bank details, bank account number etc might be displayed without ciphering. Some information such as financial transaction for purchase of item over web or mobile phone will be ciphered and only deciphered by responsible financial institution. Additional security such as pin codes will be used to provide additional security to display this information on the electronic device. Higher layered security might be added to display some information such as verification codes for bank account, transaction ids on the electronic device.

Card and the electronic device will contain some elements that will be ciphered for every transaction specially when communicated through web, mobile phone, ATM etc. These dynamic elements such as transaction id, cash, bank account verification code etc will use algorithms or keys stored in the electronic device as well as the card to cipher them. The information will only be deciphered by the responsible financial institution.

The memory for storing the keys and algorithms in the electronic device will be permanent in case of loss of electricity when battery runs out. There will be temporary memory for algorithmic codes and storing ciphered ticket information for services such as trains. The card can be used as a ticket for life-time of the ticket. The space can be made available for use after the ticket expires.

The advantages of this 2-unit 'smart card' device are:

- 1) The card reduces the risk of financial transaction fraud as gaining information from the card and the electronic device will be difficult.
- 2) When one component is lost, it can be replaced by the card issuing authority with appropriate algorithm.
- 3) Since for every transaction, there is a new code, it can safely be used anywhere even on internet banking and for internet shopping.
- 4) One card can be used for several banks and financial houses. Each bank can feed its own algorithm in the card and the watch chips. The user can set and view the desired bank account by adjusting it on the watch.
- 5) A big advantage of such a card can be storage of electronic cash between the card and the electronic device. Some money can be stored in the electronic device and the card. This amount or any part of it can be directly transferred from one activated transaction system or 'safe card' to another. No cumbersome apparatus is needed to carry out this cash transfer

between two 'safe cards' and no extra expenses are involved in the process. Thus, even everyday small purchases like purchasing anything from a vendor or buying a newspaper from a hawker can be done without cash. Since, one will not be carrying cash, there will no danger of pockets being picked. The electronic cash can also be used to use ticket machines to use train, cinema or other services.

- 6) The 'safe card' can also be used to store ticket information for services such as using trains, cinema etc. The transaction for purchase of the tickets can be kept in memory (possibly temporary) for the life-time of the ticket.
- 7) The 'safe card' can also be used for storing and using personal identity documents (such as Passport, National ID etc).
- 8) It can also be used for service contracts like travel-passes, memberships of clubs etc. Further, it can be used as a pass for entrance to electronically secure buildings etc.

It cannot be claimed that the 'safe card' is 100% fool-proof, but it offers much better operational security than any card devised so far. It will help the card industry bring its losses to the minimum possible and keeping the use of the card as convenient as possible.

While the description for the patent only relates to the financial transaction, the card can be used for any other sort of identification such as passport, driving license etc.

## **PATENT CLAIM**

A patent is claimed for

1) devising a safer bank and credit card to be called 'safe card', which will consist of two parts:

a) a card bearing a chip (the chip carrying only part of a code) and an electronic shoe device for insertion into the socket of

b) an electronic device (such as PDA, computer, watch or mobile phone) holding another battery operated chip which will transfer its algorithmic code (already fed into it) to the card, thus activating the card for use.

2) information to be split between the card and the electronic device with different degrees of security that is achieved through ciphering and/or pin codes.

3) some information such as cash, transaction details are ciphered when communicating or displaying through the electronic device.

4) besides financial transactions, the card can also be used for several other functions as detailed in the introduction.



Amendments to the claims have been filed as follows

## **PATENT CLAIM**

A patent is claimed for

- 1) a smart card transaction system consisting of two parts:
  - a) a card bearing a chip (the chip on the card carrying only part of a code) and an electronic shoe device for insertion into the socket of
  - b) an electronic device (such as PDA, computer, watch or mobile phone) holding a battery operated chip which will transfer its algorithmic code (already fed into it) to the card, thus activating the card for use, so that for every transaction a new code will be inserted deleting the used one, thus making the card immune from forgery.
  
- 2) a smart card transaction system according to claim 1, with different degrees of security that is achieved through ciphering and/or pin codes.
  
- 3) a smart card transaction system according to claim 2, with some information such as cash, transaction details ciphered when communicating or displaying through the electronic device.

4) a smart card transaction system according to claim 3, that can also be used for several functions other than financial transactions as detailed in the introduction.



INVESTOR IN PEOPLE

Application No: GB0414752.6  
Claims searched: 1-4

Examiner: Richard Pannett  
Date of search: 12 August 2004

### Patents Act 1977: Search Report under Section 17

#### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A,E	-	GB2396330 A (MOTOROLA INC) See: abstract; page 5 lines 6-12; page 6 line 8 to page 7 line 33; figures 1-4.
A	-	WO98/12675 A2 (BRENNAN) See: abstract; page 19 line 13 to page 21 line 13; figures 1-9.
A	-	WO91/13411 A1 (VILLIKARI) See: abstract; page 3 line 28 to page 5 line 24; figures 1-4.
A	-	US2002/0139844 A1 (ROCHMAN) See: abstract; paragraphs [0015]-[0017], [0067]-[0069], figures 1-4.
A	-	US5350907 A (JONIC UTVECKLINGS) See: abstract; column 3 lines 3-55; figures 1-3.

#### Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

#### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>W</sup> :

B6A; G4H

Worldwide search of patent documents classified in the following areas of the IPC<sup>07</sup>



INVESTOR IN PEOPLE

A45C; B42D; G06K; G07C; G07F; H04M

The following online and other databases have been used in the preparation of this search report

EPODOC, JAPIO, WPI, Full text