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Notice Of Entitlement

I, Robert Morton Miller, of 31 Market Street, Sydney, New South Wales, 2000, Australia, being the Patent Attorney for the Applicant/Nominated Person in respect of Application No. 68649/96, state the following:-

The Applicant/Nominated Person has entitlement from the actual inventor as follows:

The Applicant/Nominated Person is the assignee of the actual inventor.

The Applicant/Nominated Person is the applicant of the application listed in the Declaration under Article 8 of the PCT.

The basic application listed on the Declaration under Article 8 of the PCT is the first application made in a Convention country in respect of the invention.

DATED this 26th Day of August 1998

R M Miller

IRN: 394157:RMM:GVR

Instructor Code: 050634
1. Information collection system for card readers, uploading information from an offline terminal to a central processing unit, comprising:
   a first planar part with a format equivalent to the part of the chip card plugging into a card reader and possessing connection zones flush with the surface of the planar part to enable a serial transmission of information;
   a second part comprising a connector of the type enabling a parallel transmission of information;
   a third part comprising circuits making it possible to store the data received in serial form by the connection zones and to retransmit it at request in parallel form on the connector.
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**Titre**: DATA COLLECTION SYSTEM FOR CARD READERS

**Titre**: SYSTEME DE COLLECTE D'INFORMATIONS POUR LECTEURS DE CARTES

**Abstract**

A data collection system for card readers, comprising a planar portion (1) insertable into a card reader and having an ISO-type connector (10) for serial data transmission; a portion (2) comprising a PCMCIA-format connector (20) for parallel data transmission; and a portion (3) comprising circuitry for storing received data in serial form and retransmitting it in parallel form to the PCMCIA connector. The system is useful for data collection in card readers.
The invention relates to an information collection system for card readers and especially for chip card readers.

Payment for many services is now done by means of card-based systems, especially chip card systems. Chip card systems often use terminals (card readers) to carry out transactions. These transactions are in general secured with the cards of the system.

The applications of such systems currently lie in the fields of banking, access control, the distribution of power (gas, electricity, etc.), parking meters, games machines, etc. In the majority of these applications, the need to collect information on the transactions made at the terminal is vital for the functioning and security of the system.

However, certain card readers are connected to a central processing system and are known as "on-line" readers while other card readers are isolated and are connected to no other system, and are known as "off-line" readers.

In the "on-line" terminals, the problem of collection is reduced to that of developing suitable software. This is the case for example with bank terminals or card-operated electricity meters which already possess communication means. The transfer of information to the central processing unit can be done either on the initiative of the terminal, or by interrogating the central processing unit.

In terminals known as "off-line" terminals, it is necessary to find a means to transfer the data to a
central processing unit. In this case, what has to be done is to collect the data through an operator who will have to set up a connection with the terminal. Here ergonomical considerations, speed of transmission and cost will be essential parameters in the choice of a solution. The solution most usually adopted consists in connecting a portable terminal or a portable PC by means of an RS232 type connection. The main problems then are:

- the making of the connection;
- the reliability of the connection, for this kind of connection system is not designed to permit many connections;
- the cost of the terminal which, for many applications, could prove to be decisive for its use;
- the reliability with which data is transferred to the central processing unit;
- the speed of connection and transfer to the central processing unit.

The invention relates to an approach by which these problems can be resolved.

The invention therefore relates to an information collection system for card readers. This system comprises mainly:

- a part similar to the plug-in part of a chip card, comprising connection zones flush with one face of the card, enabling a serial transmission of information;
- a part comprising a connector enabling a parallel transmission of information;
- an intermediate part interconnecting the connection zones and the connector.

The intermediate portion comprises a memory to store information from one or more card readers. It may
also have a control and securing microprocessor. It is also possible to provide for a clock to date the transactions.

Other characteristics and advantages of the invention shall appear clearly in the following description, given by way of a non-restrictive example, with reference to the appended figures of which:

- Figure 1 shows a sectional view of a first exemplary embodiment according to the invention;
- Figure 2 shows a general diagram of an exemplary embodiment such as that of figure 1;
- Figure 3 shows an alternative embodiment of a system according to the invention.

The transaction terminals (or card readers) have ISO type contacts designed to be in contact with chip cards to exchange information with the cards that are connected to them.

Typically, according to current standards, the credit card type chip cards have a connector with eight plane contacts that are flush on a main face of the card. These contacts have the following functions:

- VCC and VPP = supply and programming voltage
- VSS = ground
- CLK = clock
- I/O = data
- RST, FUSES, PROG = commands.

The ISO 7816 standard for example defines the shapes and positions of these contacts. The chip card has dimensions (with sides of about 5 x 8 cm) very similar to those of the memory card, and it has a small thickness (in the range of one millimeter).

Figure 1 shows an exemplary embodiment of the information collection system according to the invention.
This system takes the form of a card having three parts:

- a part 1 that has a format equivalent to that of a chip card and possesses contacts 10 (ISO type contacts) on one of its faces so that it can be inserted into a card reader and so that the contacts set up the connections with the circuits of the card reader. More generally, the contacts 10 enable a serial transmission of information data;

- a part 2 that has an interface circuit enabling a parallel transmission of information data. This interface circuit comprises a connector 20. For example, this connector has 68 pins as in the case of a PCMCIA (Personal Computer Memory Card International Association) connector;

- a part 3 that has circuits interconnecting the contacts 10 and connector 20. These circuits enable a series/parallel conversion of information. According to the example of figure 2, these circuits comprise:

- a memory 5 designed to record the information coming from the card reader;

- a microprocessor 4 to manage the transmission of information and, in general, to manage the operation of the system;

- a power supply (battery) 8;

- a clock 6;

- a security microprocessor 7 to ensure the security of the system.

When a system of this kind is plugged into a card reader, its contacts 10 ensure a connection between the reader and the data collection system. Under the control of the control microprocessor 4 and the security microprocessor 7, a serial transmission of information data is carried out from the reader to the
memory 5. The information elements on the transactions carried out in this reader are thus "emptied" into the memory 5.

Thereafter, the collection system can be connected by its connector 20 to a microcomputer (such as a PC type personal computer) or to a bigger information-processing system.

The collection system is connected to a microcomputer like a removable memory card known in the prior art. Memory cards of this kind are mainly mass storage cards for portable computers. They could, in the future, replace diskettes and other magnetic type mass storage means. They can be used as mass storage units with a capacity as great as that of magnetic diskettes (in the range of one million bytes). Their space requirement is not greater (they have the credit card format with a thickness of 3 to 5 millimeters). They can be accessed much faster (several thousands of times faster).

Mass storage cards, which are sometimes still called PC-cards, comprise several memory chips and a connector (a 68-pin female connector according to the PCMCIA standard by the "Personal Computer Memory Card International Association", 1030B East Duane Avenue, Sunnyvale, California). The card can be plugged to a corresponding (male) connector of the microcomputer. The connections are such that the memory can be addressed by a parallel input-output port of the PC, either as if the memory were a magnetic mass storage unit or as if it were an extension of the read/write memory of the microcomputer.

The term mass storage card is generally understood to mean a card comprising several integrated circuit chips and a multiple-pin connector at the end of the
card. Typically, the PCMCIA standard defines such cards with 68 output contacts for card dimensions of approximately 5 centimeters by 8 centimeters and a thickness of about 3 to 5 millimeters. It is therefore an essentially planar card having two main parallel faces.

Under these conditions the collection system according to the invention can be connected by its connector 20 to a microcomputer (or other information-processing system) to carry out the parallel transfer of the information contained in its memory 5 and previously collected in the card readers.

Figure 2 is a diagram of the collection system according to the invention.

In the left-hand part of figure 3, there is the part 1 similar to a chip card with its connection zones 10. This part 1 can be plugged into the reader LEC represented by dashes.

In the right-hand part of figure 2, there is the connector 20 which can be plugged into a connector CO of the microcomputer PC.

The contacts 10 are connected to the circuits of the part 3 by an ISO input/output interface circuit 11. The microprocessor 4 with its program memory 4' and the data memory 5 makes it possible to receive the data received by interface 11. Address, data and control buses enable the microprocessor 4 to manage the operations of collecting data and of writing in the memory 5.

The data information can thus be transferred in serial form from the reader LEC to the memory 5 where it is stored. Then, at the time of a connection of the system to the microcomputer PC, this information can be transferred by the input-output interface circuit 21 in
parallel, and therefore at high speed, from the memory 5 to the microcomputer PC.

The system of the invention thus comprises a device for connection to a reader and a serial transmission interface. It also comprises a connection interface for parallel transmission. Circuits make it possible to store the serial information and to retransmit it in parallel form.

More precisely, the invention has the following characteristics:

- the interface 21 with the PCMCIA format makes it possible to directly connect the collection system to any computer equipped with a PCMCIA slot. The collection system thus behaves like a mass storage card when it is connected through this interface and the transfer of information towards the computer takes place as in the usual and known way for PCMCIA cards;
- the interface 11 with the ISO format enables the direct connection of the collection system with any integrated circuit card reader (ISO card reader). The collection system then behaves like a chip card and the transfer of information to the collection system takes place as in the usual and known way for integrated circuit cards;
- the collection system comprises a 68-pin female connector compatible with the PCMCIA standard to enable it to get connected into any PCMCIA slot of a computer.

The invention thus makes it possible to obtain a high speed of transfer of data through the use of the parallel port of the PCMCIA bus and, therefore, enables the transfer of a greater number of data elements in a limited period of time.

It also makes it possible to provide for the securing of the data through the use of a known
security processor capable of implementing a security 5 algorithm during the collecting of data through the 10 serial interface (ISO) and during the transfer of this 15 data through the parallel interface (PCMCIA). 20 Practically, the transfers in one direction or the other could take place only after the implementation of a reciprocal procedure of authentication bringing into play a DES or RSA algorithm performed by the 25 specialized processor 6. Such processors can be found in the market.

It furthermore enables an improvement in the ergonomical quality of the connection and a simplification of the system through direct connection to the PC (without any additional ISO card reader). It should be noted that the PCMCIA standard lays down great reliability of connection, equivalent to about 10000 insertions, and it is clear that it is much easier to plug in a PCMCIA card than to make an RS232 connection.

Figure 3 shows an alternative embodiment of the collection system according to the invention.

According to this alternative embodiment, the connector 20 of the part 2 is a male connector. Moreover, the circuits of the part 3 chiefly comprise only series/parallel interface circuits receiving information in serial form from the connector 10 of the part 1 and then transmitting it to the pins of the connector 20 in parallel form. There is furthermore provided a card 9 of the mass storage card type as described here above which, when equipped with a female connector 20', can be connected to the connector 20. This card is equipped with a data memory. It is therefore capable of receiving and storing the data
information received on the connector 20' under the control of the microprocessor 7 placed in the part 3.

Then, this card 9 could be disconnected and connected to a microcomputer to transmit the contents of its memory to this microcomputer. In practice the microcomputer is equipped with a male connector to which the card 9 is plugged. This card is then perceived by the microcomputer as a mass storage unit or as an extension memory. The memory of the card is addressed by a parallel input-output port of the PC.

The assembly shown in figure 3 thus fulfils the functions of the system of figure 2. On the other hand, it may bring greater flexibility of use while making it possible to change cards 9 at will. Thus, the system could be used more easily to collect information in readers of different types and be used in different types of applications.
The claims defining the invention are as follows:

1. Information collection system for card readers, uploading information from an offline terminal to a central processing unit, comprising:
   a first planar part with a format equivalent to the part of the chip card plugging into a card reader and possessing connection zones flush with the surface of the planar part to enable a serial transmission of information;
   a second part comprising a connector of the type enabling a parallel transmission of information;
   a third part comprising circuits making it possible to store the data received in serial form by the connection zones and to retransmit it at request in parallel form on the connector.

2. Information collection system as claimed in claim 1, wherein the circuits comprise a data memory to store the information, a microprocessor to control the system and its program memory, a clock.

3. Information collection system as claimed in claim 1, wherein the connection zones take the form of an ISO connector.

4. Information collection system as claimed in claim 1, wherein it takes the general form of a card.

5. Information collection system as claimed in claim 1, wherein the parallel connector is a PCMCIA type female connector.

6. Information collection system as claimed in claim 1, wherein the parallel connector is a male connector and in that the system comprises an additional card possessing a female connector that can be plugged to the
male connector as well as circuits connected to this female connector and comprising a data memory to store the information under the control of the microprocessor of the system and its program memory.

7. An information collection system for card readers, said system substantially as described herein with reference to Figs. 1 and 2 or Fig. 3 of the accompanying drawings.

DATED this Thirtieth Day of October 1997

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Patent Attorneys for the Applicant
SPRUSON & FERGUSON
ABSTRACT
INFORMATION COLLECTION SYSTEM
FOR CARD READERS

Information collection system for card readers comprising:
- a planar part (1) that can be plugged into a card reader and possesses an ISO type connector (10) for a serial transmission of information;
- a part (2) comprising a PCMCIA format connector (20) enabling a parallel transmission of information;
- a part (3) comprising circuits making it possible to store the data received in serial form and retransmit it in parallel form on the PCMCIA connector.

Applications: Collection of information in card readers.

FIGURE 2.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

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

B. FIELDS SEARCHED

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

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<th>Electronic data base consulted during the international search (name of data base and, where practical, search terms used)</th>
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>FR,A,2 598 469 (SOCIETE D'APPLICATIONS GENERALES D' ELECTRICITE ET DE MECANIQUE SAGEM) 27 May 1994 see the whole document</td>
<td>1,2,4-6</td>
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<td>Y</td>
<td>FR,A,2 359 562 (LABORATOIRE CENTRAL DE TELECOMMUNICATIONS) 17 February 1978 see claim 1</td>
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Further documents are listed in the continuation of box C.

Date of the actual completion of the international search: 5 August 1996

Date of mailing of the international search report: 16.08.96

Name and mailing address of the ISA

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Authorized officer

Herskovic, M
# INTERNATIONAL SEARCH REPORT

Form PCT/ISA/21 (patent family annex) (July 1992)

## Patent family members

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