

In order to avoid this type of fraud keyboard protectors have been utilized that difficult or even preclude the data typed by the user from being captured by any camera.

It occurs that to bypass this measure the defrauders begun to install
5 keyboards superposed to the machine ones. So, when typing the password, it is registered by the defrauding keyboard.

In order to avoid this to occur and to preclude the theft of information contained in the user card, the present invention presents an operation abnormality detector of the card reader, which in the occurrence of a
10 substitution of the original or superposing of a false mouthpiece, informs the alarm central and, for example, deactivate the display, not allowing the use of the terminal by any user.

In this way the present detector avoids the reading and registering of data from the card by third parties, precluding accordingly the cloning of the
15 magnetic cards.

SUMMARY OF THE INVENTION

It concerns to an operation abnormality detector of electronic modules to be positioned at the entry of a card reader of a self-serving machine, capable of capturing a change of electromagnetic field around the card reader,
20 comprised of an antenna, a sensor for picking up and transforming the signal received by the antenna; and one control board for interpreting these information that is sent by the sensor, evaluating it and eventually alerting the occurrence of fraud, with the suspension of the machine operation. By means of a set of routines the detector evaluates the presence of an alien device,
25 alerts an alarm central and stops the operation of the machine display or puts it into maintenance mode.

Therefore, the user seeing that the display is off or in maintenance will know that it is out of service, and will not utilize it, avoiding the information of his/hers card to be copied.

30 DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to an operation abnormality detector of electronic modules to be installed in the mouthpiece of a card reader of a self-serving banking machine that when detecting the occurrence of a non usual utilization of the reader, signalizes an alarm central and turns the machine
35 display off, so avoiding its utilization.

Said detector comprises an antenna for picking up the change in electromagnetic field around the card reader, a sensor for decoding the signal received by the antenna; and a control board that receives the information

decoded by the sensor, evaluating the occurrence and sending an eventual alert of fraud occurrence, for example, with the suspension of the operation of the machine, turning off the image or placing it into maintenance mode.

5 Said antenna is made of conductive metallic material and its function is picking up the change of the electromagnetic field around the card reader. Any occurrence such as the simple placing of a user's hand, insertion and removal of a banking card, superposing of a mouthpiece, removal of the reader, etc., promotes a change in the electromagnetic field that thus is received by the antenna.

10 Each type of occurrence promotes a changing magnitude in the electromagnetic field, and from them normality or abnormality operating parameters are established.

Occurrences like superposing of the reader with a false mouthpiece or its removal are established as abnormal, therefore, when it occurs, the machine display is turned off in such a way to preclude the utilization of the machine by the user.

The sensor decodes the signal received by the antenna, transforms it into digital signals and from them into information capable of being read by the control board. The control board receives this sensor information, compares it with the normal and abnormal occurrences, signaling the mouthpiece status. If the information will correspond to an abnormal occurrence, an alert to the alarm central of the bank is sent, and, for example, at the same time the display is turned off or put into maintenance mode.

25 Upon the detection of an abnormal occurrence the system can activate one or more of the following events: to turn off the machine display, to alert a police or control station, to activate a sound and/or visual alarm, to close the room where the machine is located, to issue an audible message announcing the occurrence, to activate a photographic or shooting equipment registering the identity of the agent causing the occurrence, etc.

30 The control board translates the information received from the sensor, comparing it with pre-established information as normal or abnormal, signaling its ok or not ok status, when the information is normal or abnormal, respectively. Being it abnormal, in a preferential manner, the board sends a signal of the situation status to an alarm central and turns off the display. Being the information normal the machine continues in operation.

35 Only after the removal of the false reader or superposed mouthpiece, i. e. from the device, that is promoting the abnormality in the electromagnetic field of the reader, the terminal is cleared for operating.

Thus, in the eventuality of changing the original reader by a false one or the installation of a mouthpiece over it there is a change in the electromagnetic field of the card reader that is picked up by the antenna, decoded and transformed by the sensor, and translated by the control board that signalizes the situation. Upon the replacement of the original reader or the clearing of it from a false mouthpiece, the system identifies the re-establishing of the signal normality, and the display is turned on again, allowing the utilization of the machine normally.

In this way the detector is activated whenever a foreign body is installed in the card insertion mouthpiece of the self-serving machine, or in other equipment that will utilize the reading of data from the banking card.

Therefore, in case there will be an attempt of changing readers or mouthpiece superposing by defrauders the device will detect the change in the electromagnetic field, turn off the display and send an abnormality message to an alarm central, not allowing the machine to be utilized.

Preferentially the detector does not comprise specific software for its operation and communicating with the software of the self-serving machine.

In a particular way, the antenna is installed inside the mouthpiece of the card reader of the machine and/or any other part where the reading will be necessary, and captures the change in the electromagnetic field around the card reader of the self-serving machine.

The sensor is installed in the mouthpiece of the card reader; it performs the electric reading of the signals picked up by the antenna and informs the control board on the status around the reader. Preferentially it is an electronic circuit comprised of a printed circuit board and electronic components connected to the said antenna. The sensor, through the antenna, makes the electric reading of the environment conditions around the card reader of the self-serving machine, transmitting this reading to the control board. The results from these readings oscillate when there is external and internal interference in the card reader, the level of these oscillations indicates if it is a normal transaction or a vandalism act.

The control board comprises a printed circuit board and electronic components connected to an alarm central of the self-serving machine. It is preferentially installed inside the self-serving machine's vault. Said board analyses the reading sent by the sensor, verifies if it is a normal transaction or a vandalism act. Being it a normal transaction there is no reaction from the board; if it is a vandalism act or fraud the board stops the operation of the machine, the video display is turned off or placed into

maintenance mode and the occurrence is informed to an alarm central of the machine.

A person skilled in the art promptly will note, from the description, several ways for realizing the invention without departing from the scope of the
5 attached claims.

CLAIMS

WHAT IS CLAIMED IS:

- 5 1. Operation abnormality detector of electronic modules to be installed in a self-serving banking machine characterized by the detector comprising an antenna for picking up the change of the electromagnetic field around the card reader; a sensor for decoding the signal received by the antenna; and a control board that receives the information decoded by the sensor, evaluates the normality of the electromagnetic field change, and sends a signal in case of abnormality.
- 10 2. The operation abnormality detector of electronic modules of claim 1, characterized by the fact that the control board activates one or more of the following events: alert to an alarm central, turning off of the machine display, alert to a police or control station, activation of sound and/or visual alarm, closing of the room where the machine is located, output of an audible
15 message communicating the occurrence, activation of a photographic or shooting equipment registering the identity of the agent causing the occurrence.
- 20 3. The operation abnormality detector of electronic modules of claim 1, characterized by the fact that the control board activates an alarm central at the same time that it turns off the machine display.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/BR 2007/000125

A. CLASSIFICATION OF SUBJECT MATTER IPC ^B : G07F 19/00 (2006.01); G08B 13/24 (2006.01) 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) IPC ^B : G07F, G08B, G01R, G06F		
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 practicable, search terms used) WPI, EPODOC, TXTEN, TXTDE, NPL		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0454570 A (SAGEM SOC APPL ELEC) 30 October 1991 (30.10.1991) <i>Entire document (see especially Abstract; Fig.1 and its associated description; Claims 1-8)</i>	1
Y	--	2,3
Y	FR 2554262 A (FLONIC SA) 3 May 1985 (03.05.1985) <i>Abstract; Fig.1 and its associated description; Claims</i>	2
A	--	1,3
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 application or patent 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 31 July 2007 (31.07.2007)		Date of mailing of the international search report 20 August 2007 (20.08.2007)
Name and mailing address of the ISA/ AT Austrian Patent Office Dresdner Straße 87, A-1200 Vienna Facsimile No. +43 / 1 / 534 24 / 535		Authorized officer KÖGL C. Telephone No. +43 / 1 / 534 24 / 440

INTERNATIONAL SEARCH REPORT

International application No.
PCT/BR 2007/000125

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	FR 2474204 A (TRANSAC DEVELOP TRANSAC AUTOMA) 24 July 1981 (24.07.1981) <i>Abstract; Fig.1 and its associated description; Claims</i>	1-3
A	--	1
A	JP 4054585 A (OMRON TATEISI ELECTRONICS CO) 21 February 1992 (21.02.1992) <i>Abstract; Figs.1-3 and their associated descriptions; Claims</i>	1
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A	JP 2004/227443 A (OKURA ATSUSHI) 12 August 2004 (12.08.2004) <i>Abstract</i>	1

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Information on patent family members

International application No.
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