

(19)



(11)

EP 2 000 622 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

10.12.2008 Bulletin 2008/50

(51) Int Cl.:

E05G 1/14 (2006.01)

E05G 1/10 (2006.01)

(21) Application number: **07109700.0**

(22) Date of filing: **06.06.2007**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE
SI SK TR**

Designated Extension States:

AL BA HR MK RS

(71) Applicant: **Petersen-Bach A/S**

3450 Allerød (DK)

(72) Inventors:

- **Laursen, Ole**
3450, Allerød (DK)
- **Hesselballe, Jacob**
3460, Birkerød (DK)

(74) Representative: **Plougmann & Vingtoft A/S**

Sundkrogsgade 9
P.O. Box 831
2100 Copenhagen Ø (DK)

(54) **A security system for securing valuables**

(57) A security system for securing valuables comprising a cassette for accommodating the valuables, a security system for initiating a security routine in case of a detected unauthorised handling of the container, and an automatic teller machine (ATM) for containing one or

more containers and for paying out or receiving bank notes. The system provides several enhanced security measures.

EP 2 000 622 A1

Description

[0001] This invention relates to security systems for securing valuables such as bank notes.

[0002] In cash centres bank notes are filled into specialised cassettes. After a possible storage time at the cash centre cassettes are transported to automatic teller machines, ATM's, where one or more cassettes are installed. The ATM's pay out bank notes from the cassettes, and after a period of time the cassettes are returned to the cash centre for being refilled. ATM's can also be configured to receive bank notes and in the following an ATM should be understood as having either or both of these functions. At any time, and in particular during transition from one phase to another, the cassettes and their content must be protected against attacks and theft. At a detected unauthorised handling of a cassette or any other component in the system, e.g. an attack or attempt of theft, a security routine is initiated. Several systems and methods for protecting the contents of the cassette are known, such as spraying the content with ink, sounding an alarm or sending a silent message.

[0003] Cassettes containing bank notes are of a size and weight that can be carried and handled by a person. Such cassettes have a protecting system for protecting the content of the cassettes e.g. by spraying the content with ink in case of a detected unauthorised handling of the cassette. The protecting system can be in a passive mode where their protection system is turned off. The passive mode can be entered in secure environments, e.g. in a cash centre where cassettes are filled with bank notes. Cassettes can also be in an active mode where their protection system is turned on, and detection of an unauthorised handling of a cassette will trigger the protection system and a protection routine is initiated. Cassettes may have several levels of active mode depending e.g. on the environment and the situation.

A. When cassettes containing valuables such as bank notes are in a safe environment such as a cash centre they are normally in a passive mode since the safe environment is relied upon for protecting the cassettes and their content. However, if filled cassettes that are in their passive mode and stored in the cash centre are handled in an unauthorised manner, e.g. if the cash centre is attacked, the cassettes and their content are vulnerable and at risk.

According to the invention this problem is solved by providing a wireless transmitter in the safe environment, the transmitter emitting a wireless signal such as an RF signal or an IR signal to be received by a receiver in the cassettes or connected thereto, and by putting stored cassettes in their active mode even when in the safe environment. As long as the wireless signal is properly received by the receiver, and no unauthorised handling is detected, the protection system will not be triggered. On the other hand, absence of proper reception of the wireless signal is

interpreted as the corresponding cassette being moved out of reach of the transmitter of the wireless signals, and the protection system is triggered to initiate a protection routine.

B. Protection systems that spray the content of cassettes with ink or other substances are known.

According to the invention the protection system has two or more compartments containing different reactants that will react chemically with each other when mixed or otherwise brought into contact with each other so as to form a product that indelibly marks and degrades or spoils the content such as bank notes in the cassettes. Each of the two reactants can be optimised for several properties such as storage properties, flow properties, hazards, toxicity, ease of handling etc. The reaction product can be a dye or an adhesive that cures after mixing of the reactants, an etching product, or the chemical reaction of the reactants may release energy in the form of heat, all of which will irreversibly degrade the content of the cassettes.

C. Cassettes having a security system are known. If the security system is suddenly destroyed, e.g. by a gunshot destroying vital parts of the security system, the security system may fail to react and to trigger the protection routine, whereby the cassettes and their content are vulnerable and at risk.

According to the invention this problem is solved by providing a redundant security system with two separate security systems each of which is capable of initiating the security routines. The two security systems should be placed at different locations so that e.g. a gunshot will not destroy both. A communication is established between the two systems, and in case one system fails due e.g. to a sudden destruction, the other system will react by triggering the protection system and the protection routine is initiated. As long as each system is satisfied that the other is functioning properly, and no unauthorised handling is detected, the protection system will not be triggered.

D. Water and other liquids in the cassettes or in their security system may reduce the effectiveness of the system and in particular of the substances (ink, glue etc.) that are used for degrading the content of containers. In consequence the degradation of some or all valuables such as bank notes may not be satisfactory. Electrically conductive liquids such as water can be detected due to their conductivity, and if e.g. water is detected in the cassette, this may be interpreted as unauthorised handling and the security routine is initiated. Non-conducting substances, e.g. oily substances such as diesel fuel, cannot be detected using conductivity sensors, and if such substances are introduced into the cassette or their security system as an unauthorised handling, the known security systems may not detect this with the consequence that the security routine is not initiated.

According to the invention the security system comprises a sensor capable of detecting non-conducting substances, in particular liquids or oily substances such as diesel fuel. If the cassette is unauthorised immersed in such substance or liquid the sensor will detect this and the security system will react by triggering the protection system and the protection routine is initiated.

E. In today's ATM's the cassette security system does not communicate to exchange data with the ATM itself. If e.g. the security system in a cassette for some reason has initiated its security routine and has sprayed the bank notes in the cassette with ink, there is a risk that the ATM will issue bank notes that are spoiled by the ink. Also, each cassette has its own security system which is independent of the security systems in other cassettes in the ATM. This also entails that each cassette must independently detect possible unauthorised handling and react accordingly independent on the other cassettes in the ATM.

According to the invention a wired or wireless communication is provided between the ATM and the cassette that enables a full and detailed status report to be transmitted from each cassette to the ATM and further e.g. to a central monitoring station. Such a report can include a service request and reporting that the security routine has been initiated. Remote control signals can be transmitted to the ATM and to some or all of the cassettes in the ATM e.g. instructions to perform certain functions including initiating the security routine. In case of a detected attack on one cassette the ATM or a remote controller can send a control signal causing remaining cassettes to initiate their security routine whereby the valuables contained therein are degraded.

F. Cassettes for containing bank notes are usually fitted with a lid containing the security system including sensors, a controller and e.g. an ink spraying system. The lid has, or can have, a grid or mesh of closely spaced electrically conductive wires between the outer side of the lid and the security system. The grid has a layout that ensures that even if a small hole made in an attempt to get unauthorised access to the interior of the cassette the wire will be broken at least one place which is detected by the security system, and a protection routine can be initiated. Whereas the lid with the security system has or can have such a grid or mesh the walls of the remaining of the cassette do not have such a system, which makes them vulnerable. Other methods are therefore used for detecting unauthorised openings being made in the walls of the cassette other than the lid. According to the invention cassettes are provided with a grid or mesh of closely spaced electrically conductive wires not only in the lid but in some or all of the remaining walls of the cassette. Thereby the same security system which is used for watching the

lid can be used for watching all the walls of the cassette.

G. Cassettes with an ink spraying system in the lid perform better when the lid and the spraying system are above the valuables in the cassette than when turned upside down, in particular if the valuables are bank notes. This is due to the combined effect of the capillary effect and gravity. If the cassette is turned upside down, the ink will be sprayed onto the bank notes from below, and gravity will counteract the capillary effect resulting in poorer performance.

According to the invention the cassette has at least two sets of spraying nozzles, preferably on opposite sides of the cassette or possibly surrounding the cavity of the cassette. The sets of spraying nozzles may be activated together by the same system so that ink is sprayed simultaneously from two or more sides onto the bank notes, or the security system can have a gravity direction detector and depending on the detected direction of gravity at least the uppermost set of spraying nozzles will be activated. It is hereby ensured that the content in the cassette will always be sprayed with in at least from above, i.e. the side where gravity will assist in distributing the ink.

Claims

1. A security system for securing valuables comprising

- one or more cassettes for holding the valuables,
- an enclosure (cash centre) for storing the one or more cassettes,
- a wireless transmitter in the enclosure, the transmitter being arranged to emit a wireless signal,

the cassettes having a receiver for receiving the signals transmitted by the transmitter, the cassettes comprising a security system for performing a degradation of content in the cassettes, where

- the degradation is prevented in case of proper reception of the signal and
- the degradation is performed in case of improper reception of the signal.

2. A security system for securing valuables, the system comprising a cassette for accommodating the valuables, and a compartment containing a substance to be ejected from the compartment in case of a detected unauthorised handling of the cassette, so that the ejected substance comes in contact with the valuables,

characterized in that the system comprises two compartments containing different reactants that will react chemically with each other when mixed or oth-

erwise brought into contact with each other so as to form a product to come in contact with the valuables to render the valuables useless.

3. A security system for securing valuables, the system comprising a container for accommodating the valuables and a security system for initiating a security routine in case of a detected unauthorised handling of the container,
characterized in that the security system comprises a first and a second subsystem each of which is capable of initiating the security routine, where each subsystem is arranged to initiate the security routine in case of a predetermined condition in the other subsystem.
 4. A security system for securing valuables, the system comprising a container for accommodating the valuables and a security system for initiating a security routine in case of a detected unauthorised handling of the container,
characterized in that the security system comprises a sensor capable of detecting non-conducting liquid substances, in particular oily substances or liquids such as diesel fuel and that the security system is arranged to initiate the security routine in case a non-conducting liquid substance is detected.
 5. A system for handling bank notes, the system comprising
 - a container for accommodating the bank notes,
 - an apparatus (ATM) for containing one or more containers and for paying out or receiving bank notes, and
 - a security system for initiating a security routine in case of a detected unauthorised handling of the system,**characterized in that** a wired or wireless communication is provided between the apparatus and the container enabling data to be exchanged between the apparatus and the container.
 6. An apparatus (ATM) for use in a system according to claim 5 and for containing one or more containers with bank notes and for paying out bank notes from the container or for receiving bank notes,
characterized in that the apparatus has means for communicating with the container enabling data to be exchanged between the apparatus and the container.
 7. A container for containing bank notes and for use with an apparatus according to claim 6
characterized in that the container has means for communicating with the apparatus enabling data to be exchanged between the container and the appa-

ratus.

8. A security system for securing valuables, the system comprising a container for accommodating the valuables, the container having a lid containing a security system for initiating a security routine in case of a detected unauthorised handling of the container, a grid or mesh of one or more closely spaced electrically conductive wires being arranged between the outer side of the lid and the security system, the security system being arranged to initiate the security routine in case one of the electrically conductive wires being interrupted,
characterized in that one or more walls of the cassette have a grid or mesh of one or more closely spaced electrically conductive wires, and that the security system being arranged to initiate the security routine in case one of the electrically conductive wires in the walls of the cassette is interrupted.
9. A security system for securing valuables, the system comprising a container for accommodating the valuables and a security system for initiating a security routine in case of a detected unauthorised handling of the container, the security system comprising a first set of one or more nozzles arranged on the inner side of a first wall of the cassette, the security routine comprising spraying a liquid on the valuables in the cassette,
characterized in that the security system comprises a second set of one or more nozzles arranged on the inner side of a second wall of the cassette, and that the security routine comprises spraying a liquid on the valuables in the cassette through at least the uppermost of the first and second set of nozzles.



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 07 10 9700

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 331 347 A (WINCOR NIXDORF INTERNAT GMBH [DE]) 30 July 2003 (2003-07-30) * paragraph [0010] - paragraph [0014] * * figures 1-3 *	1	INV. E05G1/14 E05G1/10
X	FR 2 866 357 A (BRINK S FRANCE [FR]) 19 August 2005 (2005-08-19) * page 3, line 27 - page 4, line 2 * * figure 1 *	2	
Y	US 5 406 896 A (JACOBSON CHRISTER [SE]) 18 April 1995 (1995-04-18) * column 1, line 51 - column 2, line 59 * * figures 1-3 *	3	
Y	US 5 652 566 A (LAMBERT SCOTT ANTHONY [US]) 29 July 1997 (1997-07-29) * column 1, line 42 - line 64 * * figure 1 *	3	
A	US 4 273 478 A (CEDERGREN STIG) 16 June 1981 (1981-06-16) * abstract * * column 4, line 43 - line 46 *	4	TECHNICAL FIELDS SEARCHED (IPC) E05G G08B
X	EP 1 624 426 A (3SI SECURITY SYSTEMS INC [US]) 8 February 2006 (2006-02-08) * paragraphs [0011] - [0015], [0019], [0022] * * figure 1 *	5-7	
X	FR 2 892 757 A (AXYTRANS SA [FR]) 4 May 2007 (2007-05-04) * page 3, line 25 - line 32 * * page 5, line 1 - line 10 * * figures 1,2 *	9	
4 The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 February 2008	Examiner Van Kessel, Jeroen
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04001)



European Patent
Office

Application Number
EP 07 10 9700

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
1-7,9
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:
- ☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claim: 1

security system for securing valuables performing
degradation in case of improper reception of an external
wireless signal

2. claim: 3

redundant security system for securing valuables with two
separate security systems

3. claim: 4

security system for securing valuables comprising a sensor
capable of detecting non-conducting liquid substances

4. claims: 5-7

secure system for handling banknotes

5. claim: 8

security system for securing valuables initiating a security
routine on interruption of electrically conductive wires

6. claim: 2

security system for securing valuables performing
degradation by mixing two different reactants

7. claim: 9

security system for securing valuables performing
degradation by spraying a liquid on the valuables through a
first and second set of nozzles

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 10 9700

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

06-02-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1331347	A	30-07-2003	DE 10202884 A1	14-08-2003
FR 2866357	A	19-08-2005	NONE	
US 5406896	A	18-04-1995	DE 68913210 D1	24-03-1994
			DE 68913210 T2	19-05-1994
			EP 0446270 A1	18-09-1991
			ES 2051007 T3	01-06-1994
			SE 464926 B	01-07-1991
			SE 8804397 A	06-06-1990
			WO 9006414 A1	14-06-1990
US 5652566	A	29-07-1997	NONE	
US 4273478	A	16-06-1981	AU 515144 B2	19-03-1981
			AU 3486878 A	11-10-1979
			BR 7802284 A	28-11-1978
			CH 631232 A5	30-07-1982
			DE 2814410 A1	19-10-1978
			DK 156478 A	13-10-1978
			FR 2387345 A1	10-11-1978
			GB 1593041 A	15-07-1981
			IT 1095865 B	17-08-1985
			JP 1379669 C	28-05-1987
			JP 53128875 A	10-11-1978
			JP 61046634 B	15-10-1986
			NL 7803843 A	16-10-1978
			SE 411137 B	03-12-1979
			SE 7704195 A	13-10-1978
			ZA 7801924 A	28-03-1979
EP 1624426	A	08-02-2006	BR PI0503273 A	21-03-2006
			US 2006028341 A1	09-02-2006
FR 2892757	A	04-05-2007	WO 2007048939 A1	03-05-2007