

Description**POS SYSTEM ELECTRONIC CARD HOUSING ASSEMBLED WITH MEMORY
MODULE HOUSING**

- [0001] The present invention relates to a security arrangement intended to prevent unauthorized access by a fraudulent attempt to a memory module containing sensitive financial data by way of removing the memory module in a point-of-sale (POS) device.
- [0002] Protection of data stored in card payment systems has a significant importance. Several security measures are taken as defined according to international standards to prevent unauthorized access to the memory module. To this end, the POS system may get blocked in the event that an unauthorized access attempt is detected.
- [0003] In card payment systems, the transaction history data is saved on memory modules as imposed by fiscal authorities, such data needed to be preserved for a certain time duration. In order to prevent non-authorized treatment of the data preserved on the memory module, it is necessary to take several security measures involving mechanical access detection systems by which unauthorized access to the POS system can be detected.
- [0004] A conventional memory module may be attached to the POS system by way of applying epoxy resin. However, this causes manufacturing difficulties as well as maintenance/repair inconveniences because the manufacturing process involves non-automated steps and repair and replacement costs are higher. The present invention overcomes these drawbacks by means of a memory module mountable in the POS device to establish a direct connection with the main board such that access to the memory module by a fraudulent attempt by way of removing the same is detectable.
- [0005] In POS systems, it is expected that unauthorized separation attempt of a memory module housing portion and an electronic card portion of the POS system is visually directly noticeable.
- [0006] Among others, a prior art publication in the technical field of the invention may be referred to as CN2746460, which discloses a lead sealing device

for tax control cash register. On the fastening point of the upper shell and the lower shell of the register shell of the tax control cash register, a threaded hole is arranged on top of the lower shell, and on the point of the upper shell corresponding to the threaded hole, a stepped hole is provided which is concentric with the threaded hole. The cross section of the upper stepped hole is a polygon hole which is internally embedded with a sleeve matching with the external shape of the polygon hole. The sleeves provide with a cylindrical stepped hole, and a bolt is penetrated through the sleeve, with the bolt head pressed on the stepped bottom surface of the sleeve. The bolt is screwed in the threaded hole of the lower shell, and the upper part of the bolt head is filled with a lead pole. The upper end face of the lead pole is printed with character punching prints by a typewriting punching head. When maintenance persons need to open the tax control cash register, they can knock the conical pole body of an opening punch into the lead pole, and rotate the crank of the opening punch to remove the lead pole having the character punching prints, so that the bolt can be dismounted by a screwdriver to open the upper shell and the lower shell.

- [0007] The present invention provides a POS device memory module and electronic card housing portions protection system involving a security arrangement as defined by the characterizing features in Claim 1 and subsequent Claims.
- [0008] Primary object of the present invention is to provide POS device memory module and electronic card housing portions protection system effective in visually exhibiting attempt of unauthorized access to the inner components and thereby preventing manipulation of the memory module.
- [0009] The present invention proposes a point-of-sale (POS) system comprising a bottom body portion with a memory module and an upper body portion with a main board, the module and the main board communicating only when the two body portions are fixedly attached to each other.
- [0010] A nut fixing apparatus is cooperatively assembled with a connection device of the upper body portion while a nut fixing apparatus projection of the nut fixing apparatus forms a threaded through-bore extending to the outer surface of the bottom body portion passing through an opening of

the connection device. This structure allows that a fixing screw can be threaded into the through-bore to mechanically secure the nut fixing apparatus relative to the connection device, also meaning that the bottom body portion and the upper body portion are fixedly joined to each other.

- [0011] The nut fixing apparatus has a position on the upper body portion is fixed by securing its base in a corresponding slot of the upper body portion. Further, an internal tab of the bottom body portion receives the fixing screw through a screw aperture thereof, whereby an improved engagement is obtained between the connection device and the bottom body portion and therefore between the upper and bottom body portions.
- [0012] Moreover, the nut fixing apparatus and the connection device are also interengaged by means of a retention member of the connection device mating with a notch of the nut fixing apparatus.
- [0013] A breakable seal is placed over the fixing screw in its fixation slot whereby the breakable seal produces a visual indication of an unauthorized tampering attempt by breaking apart when the upper body portion is forced to be separated from the bottom body portion.
- [0014] Accompanying drawings are given solely for the purpose of exemplifying a POS device protection arrangement, whose advantages over prior art were outlined above and will be explained in brief hereinafter.
- [0015] The drawings are not meant to delimit the scope of protection as identified in the Claims, nor should they be referred to alone in an effort to interpret the scope identified in the Claims without recourse to the technical disclosure in the description of the present invention.
- [0016] Fig. 1 demonstrates a perspective view of a connection device within an upper body portion of a POS system while a nut fixing apparatus is in an unassembled state according to the present invention.
- [0017] Fig. 2 demonstrates a perspective view of a POS system in an assembled manner according to the present invention.
- [0018] Fig. 3 demonstrates a perspective inner-side view of the upper body portion while the nut fixing apparatus is connected with the connection device according to the present invention.
- [0019] Fig. 4 demonstrates another perspective view of the POS system in an

assembled manner according to the present invention.

[0020] Fig. 5 demonstrates a perspective view of the POS system in an assembled manner while an external nut is attached according to the present invention.

[0021] Fig. 6 demonstrates a perspective view of the POS system in an assembled manner while a fixing screw is mounted according to the present invention.

[0022] Fig. 7 demonstrates a perspective view of the POS system in an assembled manner while a breakable seal is attached according to the present invention.

[0023] The following numerals are assigned to different part number used in the detailed description:

1. POS system
2. Security sealing
3. Nut fixing apparatus
4. Connection device
5. Retention member
6. Notch
7. External nut
8. Fixing screw
9. Breakable seal
10. Through-bore
11. Upper body portion
12. Bottom body portion
13. Fixation slot
14. Connection means
15. Projection
16. Internal tab

[0024] The present invention relates to a security sealing (2) of a POS (point-of-sale) system (1) to visually exhibit an occurrence to disassemble an upper body portion (11) from a bottom body portion (12) by means of a breakable seal (9).

[0025] A memory module of the POS system (1) is embedded within a housing

portion of the bottom body portion (12) so as to communicate with an electronic control card, i.e. a main board located in the upper body portion (11) of the POS system (1).

- [0026] The memory module being conventionally attached to and embedded in the POS system (1) by way of applying epoxy resin so as to prevent access thereto, causes manufacturing difficulties as well as maintenance/repair inconveniences because the manufacturing process involves non-automated steps and repair and replacement costs are higher, the present invention overcomes these drawbacks by means of a memory module mountable in the POS device to establish a direct connection with the main board such that access to the memory module by a fraudulent attempt by way of removing the same is detectable because in case an attempt of tampering with the POS system (1) occurs, the electrical contact between the memory module and the main board is cut and the information in relation with the signal interruption is recorded in the memory module. Therefore, if one attempts at separating the bottom body portion (12) and the upper body portion (11), loss of electrical contact is detected.
- [0027] According to the present invention, a further safety measure is provided in the form of a security sealing (2) which visually indicates, if broken, that the bottom body portion (12) and the upper body portion (11) are separated.
- [0028] The security sealing (2) consists of a nut fixing apparatus (3) to be fitted to a connection device (4) on an inner side surface of the upper body portion (11) so as to form an assembled structure. The nut fixing apparatus (3) has a plate-like body and base, when assembled with the connection device (4), fixedly resting on the upper body portion (11).
- [0029] The nut fixing apparatus (3) has a plate-like body adjacently leans on the planar surface of the connection device (4) while a projection (15) in the form of a cylindrical extension is fitted into a circular opening of the connection device (4) so as to provide a threaded through-bore (10).
- [0030] According to the invention, the bottom body portion (12) has a fixation slot (13) on a side surface thereof, the threaded through-bore (10) of the nut

fixing apparatus (3) receiving a fixing screw (8) in the fixation slot (13). An external nut (7) is inserted into the fixation slot (13) and the fixing screw (8) is threaded into the through-bore (10) passing through the external nut (7). The bottom body portion (12) further has an internal tab (16) with a screw aperture as seen in Fig. 4, extending face-to-face in alignment with the through-bore (10) of the nut fixing apparatus (3) so that the fixation screw (8) first passes through the external nut (7) and then the screw aperture of the internal tab (16) to reach the threaded inner surface of the through-bore (10).

[0031] The fixing screw (8) therefore extends through the nut fixing apparatus (3) assembled with the connection device (4). The latter nut fixing apparatus (3) and connection device (4) are interengaged by means of a retention member (5) of the connection device (4) engaging with a notch (6) of the nut fixing apparatus (3) as best seen in Fig. 1. The interengaged structure of the nut fixing apparatus (3) with the connection device (4) due to the retention member (5) cooperating with notch (6), the nut fixing apparatus (3) also being fixedly attached at its base to the upper body portion (11), provides that the fixing screw (8) securely connects the upper body portion (11) to the bottom body portion (12) because the connection device (4) is integrally formed with the upper body portion (11) and the internal tab (16) of the bottom body portion (12) receives the fixation screw (8). Therefore a mechanically reliable connection arrangement is achieved.

[0032] According to the present invention, maintenance of the secure engagement of the upper body portion (11) with the bottom body portion (12) is ensured by the security sealing (2). The security sealing (2) provides safety for the POS system (1) in a manner that when the upper body portion (11) is forced to be separated from the bottom body portion (12), a breakable seal (9) breaks or gets damaged irreversibly so that one can visually notice occurrence of a potentially unauthorized tampering attempt.

[0033] The breakable seal (9) is attachable so as to entirely cover the outer open side of the fixation slot (13) fully concealing head of the fixing screw (8) to prevent access thereto by unauthorized parties and provide such an

indication as long as the breakable seal (9) is intact. The breakable seal (9) placed into the fixation slot (13) to fit within the circular area thereof basically provides an indication in this effect.

- [0034] Mounting of the upper and bottom unit (11, 12) of the POS system (1) is accomplished by means of connection means (14) fixedly joining the two parts by means of appropriate fixing elements (not shown). Therefore, even if the breakable seal (9) is damaged and the fixing screw (8) is removed, additional screws through the connection means (14) fixedly joining the upper and bottom unit (11, 12) should also be removed, upon which communication between the memory module and the main board will be interrupted and this information will be recorded in the memory module.
- [0035] In summary, the present invention proposes a point-of-sale (POS) system (1) to effect payment transactions, the POS system (1) comprising a bottom body portion (12) containing a memory module and an upper body portion (11) containing a main board such that the memory module and the main board communicate when the upper and bottom body portions (11, 12) are assembled to each other.
- [0036] In one embodiment of the present invention, the POS system (1) comprises a nut fixing apparatus (3) fitted to a connection device (4) of the upper body portion (11), a projection (15) of the nut fixing apparatus (3) in the form of a longitudinal cylindrical extension being fitted into an opening of the connection device (4) so as to receive a fixing screw (8) in a fixation slot (13) disposed on an outer surface of the bottom body portion (12).
- [0037] In a further embodiment of the present invention, the nut fixing apparatus (3) has a plate-like body adjacently leaning on the connection device (4).
- [0038] In a further embodiment of the present invention, the nut fixing apparatus (3) has a plate-like body and has a base which is fixedly supported on the upper body portion (11), when the nut fixing apparatus (3) is fitted to the connection device (4).
- [0039] In a further embodiment of the present invention, the projection (15) of the nut fixing apparatus (3), fitted into the opening of the connection device (4) has a threaded inner surface in the form of a threaded through-bore (10).

- [0040] In a further embodiment of the present invention, the bottom body portion (12) has an internal tab (16) with a screw aperture, extending face-to-face in alignment with the through-bore (10) of the nut fixing apparatus (3) so that the fixation screw (8) passes through the screw aperture of the internal tab (16) to reach the threaded inner surface of the through-bore (10).
- [0041] In a further embodiment of the present invention, the nut fixing apparatus (3) and the connection device (4) are interengaged by means of a retention member (5) of the connection device (4) engaging with a notch (6) of the nut fixing apparatus (3).
- [0042] In a further embodiment of the present invention, the connection device (4) is formed integrally with the upper body portion (11).
- [0043] In a further embodiment of the present invention, an external nut (7) is inserted into the fixation slot (13) providing that the fixation screw (8) passes through the external nut (7) and then the screw aperture of the internal tab (16) to reach the threaded inner surface of the through-bore (10). This interengaging relationship provides that the fixing screw (8) connects the bottom body portion (12) to the connection device (4) via the external nut (7).
- [0044] In a further embodiment of the present invention, a breakable seal (9) is placed into the fixation slot (13) to fit within the area thereof whereby when the upper body portion (11) is forced to be separated from the bottom body portion (12), the breakable seal (9) gets damaged irreversibly to produce a visual indication of an unauthorized/tampering attempt.
- [0045] In a further embodiment of the present invention, the breakable seal (9) is attachable so as to entirely cover the outer open side of the fixation slot (13) fully concealing head of the fixing screw (8).
- [0046] Therefore, the present invention proposes a POS system (1) allowing that a fixing screw (8) can be threaded into a through-bore (10) opening to a bottom body portion (12), to mechanically secure a nut fixing apparatus (3) fixedly supported on an upper body portion (11) of the POS system (1) relative to a connection device (4) also integral with the upper body portion (11), therefore ensuring that the bottom body portion (12) and the upper

body portion (11) are fixedly joined to each other.

[0047] Further, an internal tab (16) of the bottom body portion (12) provides additional engagement effect by receiving the fixing screw (8) through a screw aperture thereof. Apart from the connecting effect of the fixing screw (8), the nut fixing apparatus (3) and the connection device (4) are already in engagement via a pair of retention member (5) and a notch (6).

Claims

1. A point-of-sale (POS) system (1) to effect payment transactions, the POS system (1) comprising a bottom body portion (12) containing a memory module and an upper body portion (11) containing a main board such that the memory module and the main board communicate when the upper and bottom body portions (11, 12) are assembled to each other, **characterized in that** a nut fixing apparatus (3) fitted to a connection device (4) of the upper body portion (11), a projection (15) of the nut fixing apparatus (3) in the form of a longitudinal extension being fitted into an opening of the connection device (4) so as to receive a fixing screw (8) in a fixation slot (13) disposed on an outer surface of the bottom body portion (12).
2. A point-of-sale (POS) system (1) as in Claim 1, **characterized in that** the nut fixing apparatus (3) has a plate-like body adjacently leaning on the connection device (4).
3. A point-of-sale (POS) system (1) as in Claim 1 or 2, **characterized in that** the nut fixing apparatus (3) has a plate-like body and has a base which is fixedly supported on the upper body portion (11), when the nut fixing apparatus (3) is fitted to the connection device (4).
4. A point-of-sale (POS) system (1) as in Claim 1, 2 or 3, **characterized in that** the projection (15) of the nut fixing apparatus (3), fitted into the opening of the connection device (4) has a threaded inner surface in the form of a threaded through-bore (10).
5. A point-of-sale (POS) system (1) as in Claim 4, **characterized in that** the bottom body portion (12) has an internal tab (16) with a screw aperture, extending face-to-face in alignment with the through-bore (10) of the nut fixing apparatus (3) so that the fixation screw (8) passes through the screw aperture of the internal tab (16) to reach the threaded inner surface of the through-bore (10).
6. A point-of-sale (POS) system (1) as in Claim 1, 3, 4 or 5, **characterized in that** the nut fixing apparatus (3) and the connection device (4) are interengaged by means of a retention member (5) of the connection device (4) engaging with a notch (6) of the nut fixing apparatus (3).
7. A point-of-sale (POS) system (1) as in any preceding Claim, **characterized in**

that the connection device (4) is formed integrally with the upper body portion (11).

8. A point-of-sale (POS) system (1) as in Claim 5, **characterized in that** an external nut (7) is inserted into the fixation slot (13) providing that the fixation screw (8) passes through the external nut (7) and then the screw aperture of the internal tab (16) to reach the threaded inner surface of the through-bore (10).
9. A point-of-sale (POS) system (1) as in Claim 8, **characterized in that** a breakable seal (9) is placed into the fixation slot (13) to fit within the area thereof whereby when the upper body portion (11) is forced to be separated from the bottom body portion (12), the breakable seal (9) gets damaged irreversibly to produce a visual indication of an unauthorized attempt.
10. A point-of-sale (POS) system (1) as in Claim 9, **characterized in that** the breakable seal (9) is attachable so as to entirely cover the outer open side of the fixation slot (13) fully concealing head of the fixing screw (8).

Fig. 1

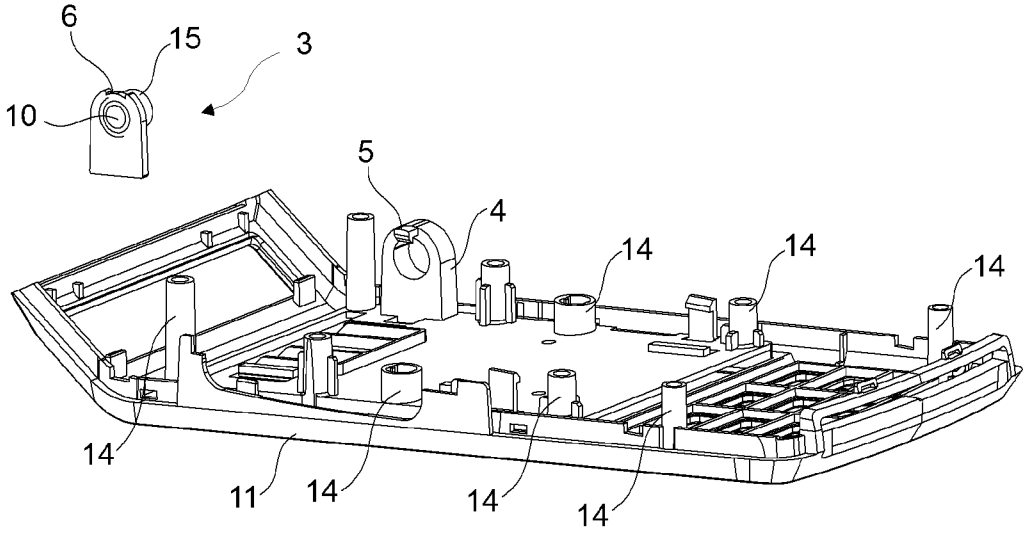


Fig. 2

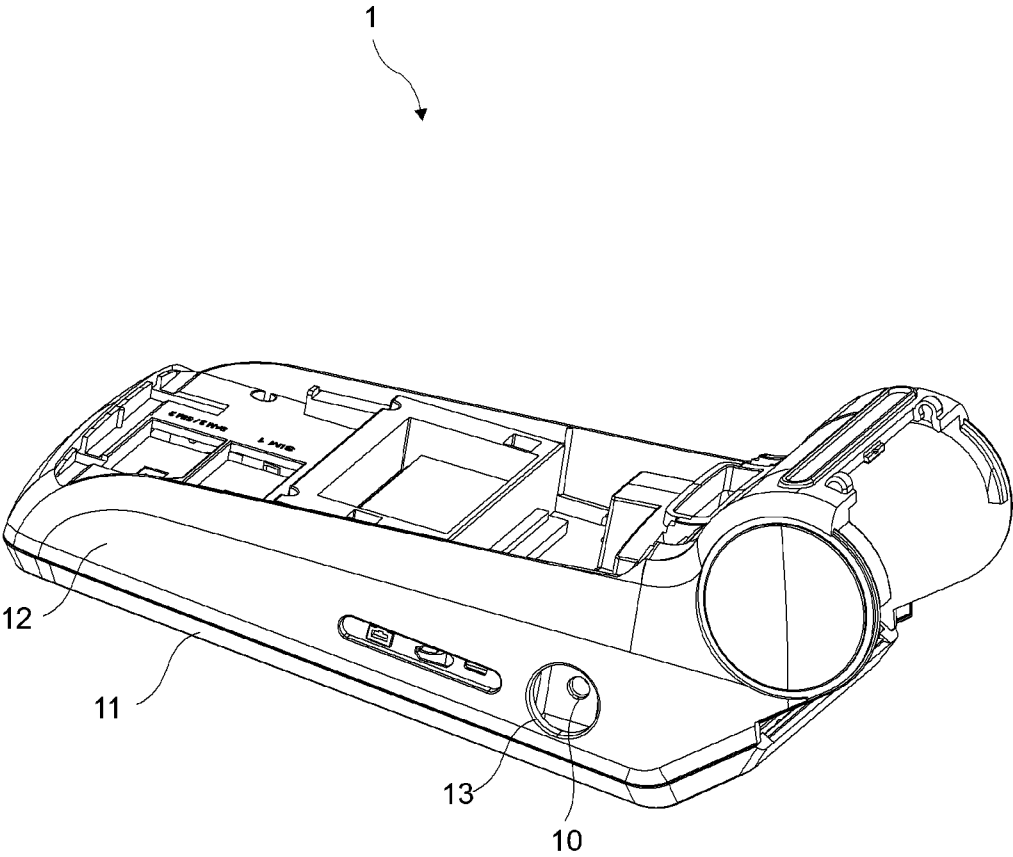
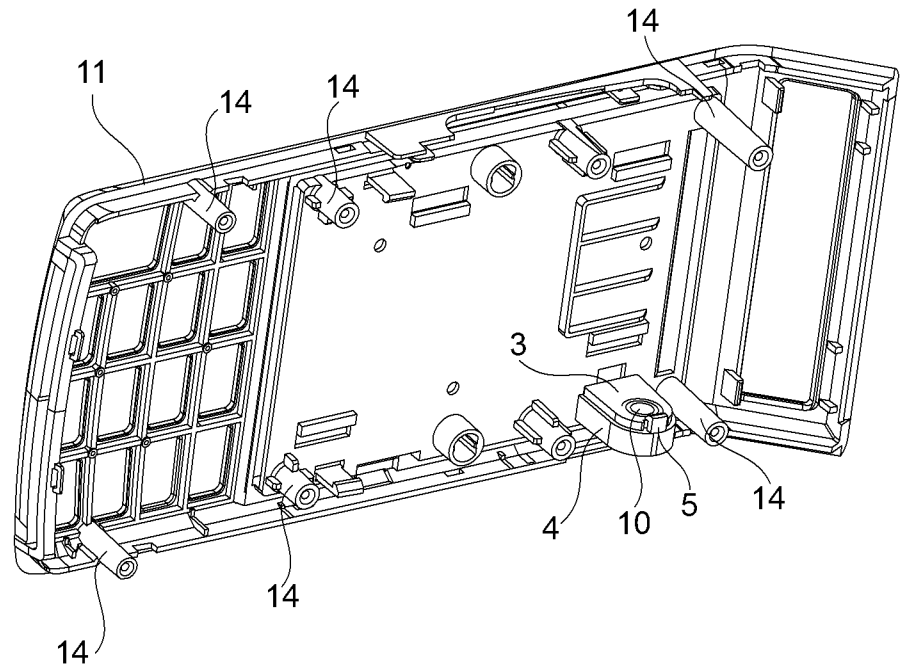


Fig. 3



4/5

Fig. 4

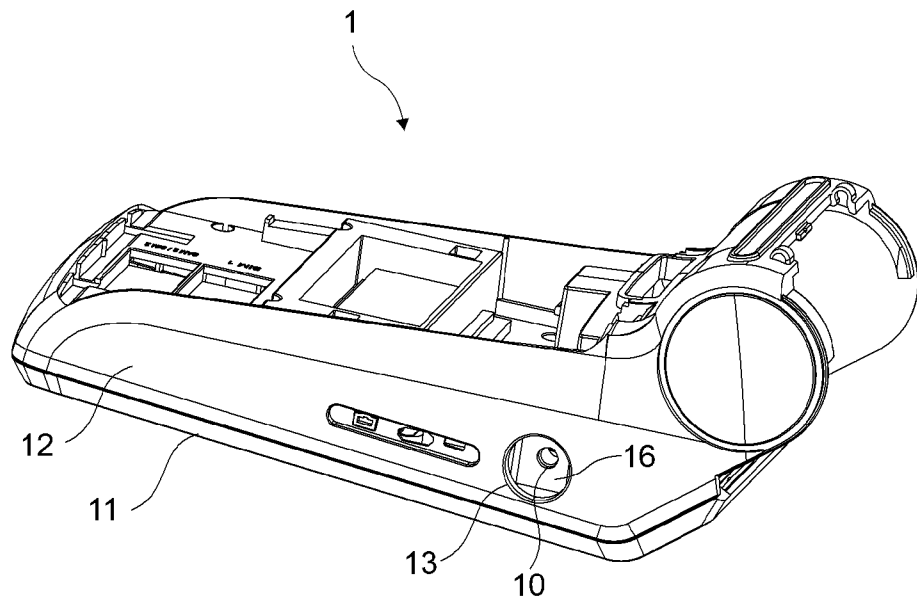


Fig. 5

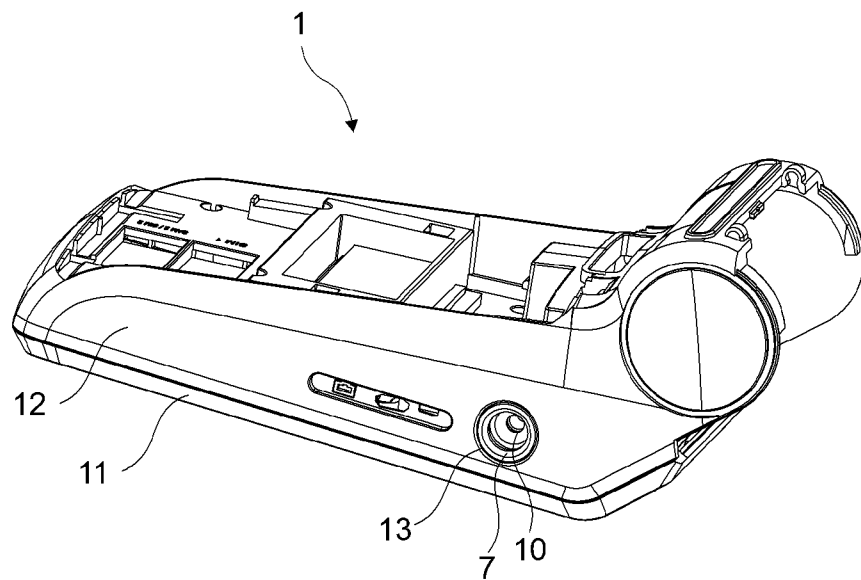


Fig. 6

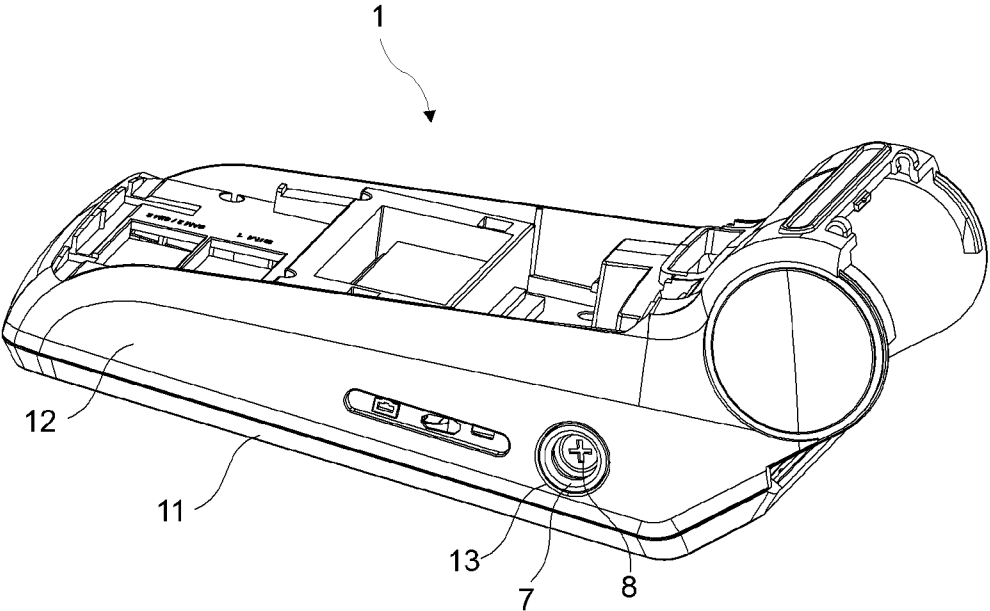
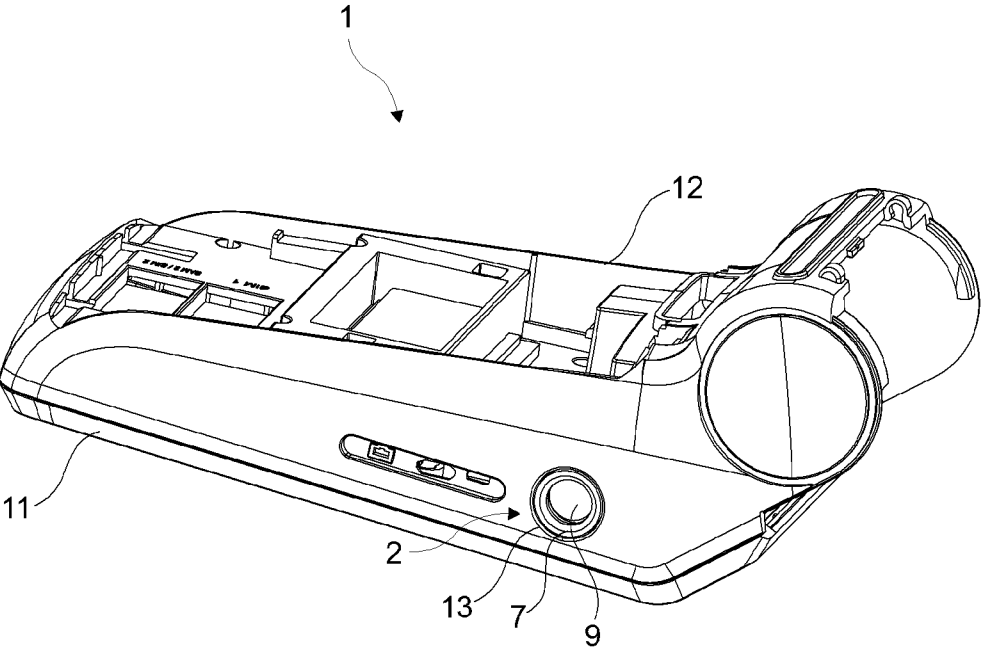


Fig. 7



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/076246

A. CLASSIFICATION OF SUBJECT MATTER
INV. G07G1/00 G06Q20/20
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)
G07G 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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 062 477 A (WIKE JR CHARLES K [US] ET AL) 16 May 2000 (2000-05-16) column 5, lines 40-44 column 6, lines 31-46 column 7, lines 54-61 column 9, lines 18-27 column 10, line 55 - column 12, line 45 -----	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 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

10 July 2015

Date of mailing of the international search report

21/07/2015

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Aupiais, Brigitte

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2014/076246

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6062477	A	16-05-2000	EP 0953949 A2 03-11-1999
			JP 4070170 B2 02-04-2008
			JP 2000207638 A 28-07-2000
			US 6062477 A 16-05-2000
