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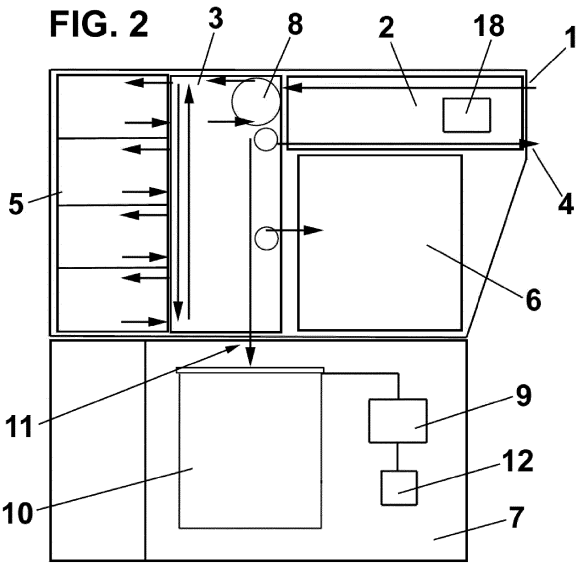
(54) AUTOMATIC COLLECTION MACHINE

(57) The automatic collection machine comprises at least one money inlet (1), through which the user introduces money; a reading unit (2) to read the money introduced in the machine and determine its value and validity; a recycling unit (5), where money is stored that is used to provide change to the user; a money outlet (4), which provides change to the user or returns money to the user; a transport unit (3), which transports the money inside the machine; a central control unit (18), which manages the operation of the machine; and an increased security zone (7) in which money is kept; wherein the increased security zone (7) comprises a security zone control unit (9) communicating with the central control unit (18) via encrypted communication.

FIG. 2



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Description

[0001] The present invention relates to an automatic collection machine, which allows automatically collecting the amount of a purchase and, if necessary, provide the corresponding change.

Background of the invention

[0002] Currently, automatic collection machines are known on the market, for the collection in shops when customers pay in cash, which facilitate and ensure the correct handling of cash to the collector of the establishment, or can even act without the intervention of the personnel of the establishment, so that only the intervention of the client is necessary.

[0003] These automatic collection machines determine the amount of money introduced by the customer, whether in bills and/or coins, check the validity of said bills and/or coins and provide the customer with the corresponding change, all in an automated way.

[0004] For this purpose, the automatic collection machines comprise a recycling unit in which bills and coins are stored to provide the corresponding change. This unit is made up of several recyclers, each recycler being assigned one or more denominations of bills or coins.

[0005] In addition, these automatic collection machines also comprise a storage unit, wherein money that is not used to provide change to customers is kept.

[0006] These automatic collection machines also comprise a recognition unit, which recognizes the bills inserted in the machine, a central control unit that determines the transport of bills, through a transport module, between the entry and exit of bills, the recycling unit and the storage unit. And also for coins, with a coin recognition unit, a central control unit that controls the transport of coins, a transport module, a coin inlet and outlet, a recycling unit and a storage unit.

[0007] One drawback of this type of collection machine is that it requires regular maintenance.

[0008] First of all, it is necessary to withdraw money from the storage unit frequently, since it has a limited capacity, and although it has a certain degree of security, it could be subject to unauthorized manipulation, which is why it is advisable that the amount of money in said storage unit is not very high.

[0009] For this reason it is common for these machines to include a safe where a certain amount of money is stored, but these safes are not connected to the rest of the machine.

[0010] An example of this type of machine with a safe is described in patent application EP3598402 A1. This document describes a safe located at the bottom of the machine, which can be opened via a keyboard by entering a code. However, this safe does not comprise any control unit connected with the central control unit of the whole machine.

[0011] Secondly, the use of used bills moving through the machine can lead to jams, and if a jam occurs, the user must interrupt the operation of the machine and remove the jammed bill, which requires a certain period of time.

Description of the invention

[0012] Therefore, an objective of the present invention is to provide an automatic collection machine that allows to store a greater amount of money than conventional machines, this amount of money being stored in an zone with greater security than the rest of the machine and that additionally this zone of greater security is securely connected to the rest of the machine.

[0013] Another objective of the present invention is to provide an automatic collection machine that may be customized in a modular way based on the needs of the user.

[0014] Another additional objective of the present invention is to provide an automatic collection machine that may be easily accessed when a jam occurs and without the need to loosen electrical connectors, which can deteriorate with handling or connect incorrectly, causing the machine to be out of service.

[0015] With the automatic collection machine of the invention, the aforementioned drawbacks are solved, presenting other advantages that will be described below.

[0016] The automatic collection machine according to the present invention comprises:

- at least one money inlet, through which the user introduces money;
- a reading unit to read the money inserted in the machine and determine its value and validity;
- a recycling unit, where money is stored that is used to provide change to the user;
- a money outlet, which provides change to the user or returns money to the user;
- a transport unit, which transports the money inside the machine; and
- an increased security zone, in which money is kept.

[0017] Said increased security zone comprises a security zone control unit communicated with the central control unit through an encrypted communication.

[0018] Thanks to this feature, there is an increased or high security zone to prevent access by unauthorized persons, allowing the storage in the safe of an adequate amount of money to extend the money collection service.

[0019] As the security zone control unit is inside the increased security zone, it cannot be operated to alter the operation of this increased security zone, for example, to force its opening.

[0020] Additionally, when the establishment has this type of security in the machine, it can arrange money collection services with companies specialized in transporting and insuring cash, guaranteeing the entire money cycle from the moment the money passes into the increased security area until it is deposited in the bank.

[0021] Furthermore, the safe comprises an insertion slot through which the money from the transport unit is inserted and a money container in which the money is stored stacked as long as necessary. The money container can be a removable bag, usually with some type of closure, a bag with heat seal closure, or some type of removable cassette.

[0022] Furthermore, said insertion slot has a shutter with the ability to close and open the slot; the shutter is advantageously connected to the security zone control unit of the safe, in this way the security zone control unit of the safe can control the opening and closing of the slot.

[0023] Preferably, the increased security zone is accessible by an electronic lock. The lock will open when the money collection personnel accredit themselves to the machine, at which point the machine, from the central control unit, will communicate with the control unit of the increased security area through an encrypted communication to indicate that the opening of the increased security zone is enabled. At this time, the collection personnel can enter the code or the card or the appropriate opening mode in the electronic lock (already enabled) and will be able to access the increased security zone.

[0024] Preferably, the increased security zone comprises a money container sealing element.

[0025] Furthermore, in the automatic collection machine according to the present invention, the security zone control unit can detect the positions or status of:

- the shutter for opening and closing the insertion slot,
- the opening and closing of a door in the increased security zone,
- external power supply to the security zone control unit,
- the fill level of the money container,
- the position, correct or not, of the money container in its location, and/or
- the status of the sealing element of the money container,

and said security zone control unit informs the central control unit of said positions or status by means of encrypted communication.

[0026] According to a preferred embodiment, the recycling unit is made up of a plurality of recycling modules and the transport unit comprises a plurality of transport modules, their number being variable and allowing the automatic collection machine to be easily configured according to the requirements of the user.

[0027] The automatic collection machine according to the present invention may also comprise a storage unit, wherein money is stored outside the increased security zone.

[0028] Furthermore, the transport unit comprises a valve that determines the transport to or from the recycling unit, the safe, the storage unit or the money outlet.

[0029] Advantageously, each transport module comprises an access cover mounted in a removable manner that facilitates access to the interior of the transport modules, where the bill circulates, making it possible to resolve a bill jam or to perform equipment maintenance cleaning easily.

[0030] In addition, the access cover of each transport module includes a direct electronic connection, by positioning the cover in its location, without the need to disconnect connectors of electrical cables to remove or open the covers and reconnect connectors of electrical cables for relocation of the cover.

Brief description of the drawings

[0031] For a better understanding of what has been stated, some drawings are attached in which, schematically and only as a non-limiting example, a practical case of embodiment is represented.

Figure 1 is a perspective view of the automatic collection machine according to the present invention;

Figure 2 is a schematic side elevation view of the automatic collection machine according to the present invention;

Figure 3 is a perspective view of the modular transport unit of the automatic collection machine according to the present invention, with the access cover of a transport module removed;

Figure 4 is a perspective view of a detail of the connection between an access cover and a transport module;

Figure 5 is a perspective view of the modular transport unit and the modular recycling unit of the automatic collection machine according to the present invention, where the valve can also be seen; and

Figure 6 is an exploded perspective view of the modular transport unit and the modular recycling unit of the automatic collection machine according to the present invention.

Description of a preferred embodiment

[0032] As shown in figure 1, the automatic collection machine according to the present invention comprises a bill inlet 1, through which a customer or a collector introduces bills for payment, a coin inlet 19, through which a customer or a collector introduces coins for payment, a bill outlet 4 and a coin outlet 20, to return the change.

[0033] It should be noted that, for the sake of simplicity, in the following description money is referred to generically to refer to bills and coins. However, the processing of the bills and the coins is carried out separately, so that it is obvious to an expert that the different units handling the bills and coins will be different.

[0034] The money introduced into the machine is read by a reading unit 2, where its value and validity are determined. If it is determined that the money is valid, that is, they are legal tender bills or coins and of the currency that the machine accepts, the money goes to a transport unit 3.

[0035] Otherwise, if it is determined that a bill or coin is false or not accepted by the machine for any reason, the bill or coin is returned to the customer through an outlet 4, or it can also be returned through the inlet 1 itself, according to the reason for rejecting the bill and its position.

[0036] The automatic collection machine also comprises a recycling unit 5, where money that is used for returns is stored, a storage unit 6, where money is stored, and an increased security zone 7, which is mainly constituted by a safe.

[0037] Said transport unit 3 comprises a valve 8, for example, a bidirectional three-way valve, which is what determines the transport of the money. An example of this valve 8 is described in European patent application EP20382144, not published at the filing date of the present application.

[0038] As shown by the arrows in Figure 2, when a bill is inserted through the inlet 1, it enters the reading unit 2, where the value of the bill and whether it is a valid bill is determined.

[0039] If the bill is determined to be valid, it proceeds to the transport unit 3, in which valve 8 determines where the bill is directed.

[0040] The bill can be directed to the recycling unit 5, for later use for a return. In this recycling unit 5, the bill will be placed in a recycling module corresponding to the value of the bill, since the recycling unit 5 comprises a plurality of recycling modules, each of which has a preassignment of the denomination of the bill or bills to store.

[0041] From this recycling unit 5, when used for a return, it will make the reverse path, through the transport unit 3 towards the outlet 4, determined by said valve 8.

[0042] Another option is that the bill is directed to the storage unit 6, where it is stored with other bills, being stacked together, where they will remain until an authorized user removes them.

[0043] A third option is for the bill to be directed to the increased security zone 7, where it will remain together with other bills until they are removed by an authorized user.

[0044] It should be noted that the coins are processed in a similar way, in a circuit independent of the bills, as indicated above.

[0045] The management of the money inside the machine is regulated by a central control unit 18, and the possible movements of the money are shown by the arrows shown in figure 2.

[0046] In particular, the central control unit 18 of the machine, which is preferably located in the reading unit 2, is in charge of managing the transport unit 3, the reading unit 2, the recycling stations 5, and the storage station 6.

[0047] The increased security zone 7 comprises a security zone control unit 9 housed inside, to control the elements inside the increased security zone and prevent unauthorized access to said increased security zone 7.

[0048] The increased security zone 7, which may be a safe, comprises a container 10 and an insertion slot 11 for the insertion of money, from the transport unit 3, into the container 10 of the increased security zone 7.

[0049] This money container 10 can be a removable bag, usually with some type of closure, or a bag with heat seal closure, or some type of removable cassette.

[0050] The increased security zone 7 comprises an electronic lock 12 that can only be opened by an authorized user, for example, using an access code via a keyboard, as long as the lock is previously enabled.

[0051] The security zone control unit 9 controls the elements that are in the increased security zone, such as the opening or closing of the insertion slot 11, the enabling or disabling of the electronic lock 12 for access to the increased security zone, and any other mechanism or automation inside the increased security zone 7, according to the requirements of the central control unit 18, which are transmitted to the control unit of the security zone 9 by means of an encrypted communication.

[0052] Additionally, the control unit of the security zone 9 is the one that detects the positions or status of the internal elements of the increased security zone 7, such as: the status of the shutter for opening and closing the insertion slot 11 , the opening and closing of the door of the increased security zone 7, the external power supply to the security zone control unit 9, the status of the internal battery, the filling level of the money container 10, the correct or non-correct position of the container 10 in its location, the state of the heat sealing automatism, and others; and reports the positions or status of all of them to the central control unit 18 by means of an encrypted communication when it requests the information of the positions and the status, by means of an encrypted communication.

[0053] When the central control unit 18 determines that a bill must go from the non-increased security zone to the increased security zone 7, the security zone control unit 9 must monitor the status of the insertion slot 11. For this purpose, the central control unit 18 performs the request for the opening of the insertion slot 11 to the security zone control unit 9 by means of the encrypted communication that it maintains with it.

[0054] When the bill or set of bills has/have entered the increased security zone 7, the central control unit 18 may require the security zone control unit e 9 to close the insertion slot 11.

[0055] In Figures 3, 5 and 6 it can be seen that the recycling unit 5 is made up of a plurality of recycling modules 13 and in Figures 5 and 6 it can be seen that the transport unit 3 is made up of a plurality of transport modules 14, which in these figures are mounted one on top of the other.

[0056] For example, each recycling module 13 has a pre-assignment of the denomination of the bill or bills, to be stored and the bills are preferably stored rolled up to allow a greater capacity.

[0057] This modularity feature allows the automatic collection machine to be easily configured based on the user requirements, as the number of transport modules 14 shall match the number of recycling modules 13.

[0058] In Figures 3 and 4 it can be seen that each transport module 14 comprises an access cover 15 mounted in a removable manner that facilitates access to the interior of the transport modules 14, through which the bill circulates, allowing to resolve a jam of a bill, perform equipment maintenance cleaning easily or replace it with another in a quick and easy way.

[0059] In addition, the access cover 15 of each transport module 14 comprises a direct electronic connection, by positioning the cover 15 in its location, without the need to disconnect connectors from the electrical cables for the extraction or opening of the covers 15 and reconnect electrical cable connectors for cover relocation 15.

[0060] In this way, one of the causes of machines out of service is avoided, such as a connection failure due to improper handling of the cables and connectors or their incorrect connection. This access cover 15 comprises an electronic connection 16, which is complementary to an electronic connection 17 of the transport module 14.

[0061] Despite the fact that reference has been made to a specific embodiment of the invention, it is clear to a person skilled in the art that the automatic collection machine described is susceptible to numerous variations and modifications, and that all the mentioned details can be substituted by others. technically equivalent, without departing from the scope of protection defined by the appended claims.

Claims

1. Automatic collection machine, comprising:

- at least one money inlet (1), through which the user introduces money;
- a reading unit (2) to read the money inserted in the machine and determine its value and validity;
- a recycling unit (5), where money is stored that is used to provide change to the user;
- a money outlet (4), which provides change to the user or returns money to the user;
- a transport unit (3), which transports the money inside the machine;
- a central control unit (18), which manages the operation of the machine; and
- an increased security zone (7) in which money is kept;

characterized in that:

the increased security zone (7) comprises a security zone control unit (9) communicated with the central control unit (18) via encrypted communication.

2. Automatic collection machine according to claim 1, wherein the increased security zone (7) comprises an insertion slot (11) and a money container (10).

3. Automatic collection machine according to claim 2, wherein said insertion slot (11) is opened and closed by means of a shutter controlled by the security zone control unit (9).

4. Automatic collection machine according to claim 1, wherein the increased security zone (7) is accessible by means of an electronic lock (12).

5. Automatic collection machine according to claim 4, wherein the electronic lock (12) is enabled and disabled from the control unit (9) of the increased security zone (7).

6. Automatic collection machine according to claim 2, wherein the increased security zone (7) comprises a sealing element of the money container (10).

7. Automatic collection machine according to any one of the preceding claims, wherein the security zone control unit (9) detects the positions or status of:

- the shutter for opening and closing the insertion slot (11), and/or
- the opening and closing of a door in the increased security zone (7), and/or
- external power supply to the security zone control unit (9), and/or
- the filling level of the money container (10), and/or
- the position, correct or not, of the money container (10) in its location, and/or
- the status of the sealing element of the money container (10).

8. Automatic collection machine according to any one of the preceding claims, wherein the security zone control unit (9) informs the central control unit (18) by means of encrypted communication of the positions or status of:

- the shutter for opening and closing the insertion slot (11), and/or
- the opening and closing of a door in the increased security zone (7), and/or
- external power supply to the security zone control unit (9), and/or
- the filling level of the money container (10), and/or

- the position, correct or not, of the money container (10) in its location, and/or
- the status of the sealing element of the money container (10).

9. Automatic collection machine according to claim 1, wherein the recycling unit (5) is formed by a plurality of recycling modules (13).

10. Automatic collection machine according to claim 1, wherein the transport unit (3) comprises a plurality of transport modules (14).

11. Automatic collection machine according to claim 9 or 10, wherein the number of recycling modules (13) and/or the number of transport modules (14) is variable

12. Automatic collection machine according to claim 1, which also comprises a storage unit (6), wherein money is stored.

13. Automatic collection machine according to claim 1, 10 or 12, wherein the transport unit (3) comprises a valve (8) that determines the transport to or from the recycling unit (5), the safe (7), the storage unit (6) or the money outlet (4).

14. Automatic collection machine according to claim 10, wherein each transport module (14) comprises an access cover (15) mounted in a removable way.

15. Automatic collection machine according to claim 14, wherein the access cover (15) of each transport module (14) comprises a direct electronic connection without cables (16).

FIG. 1

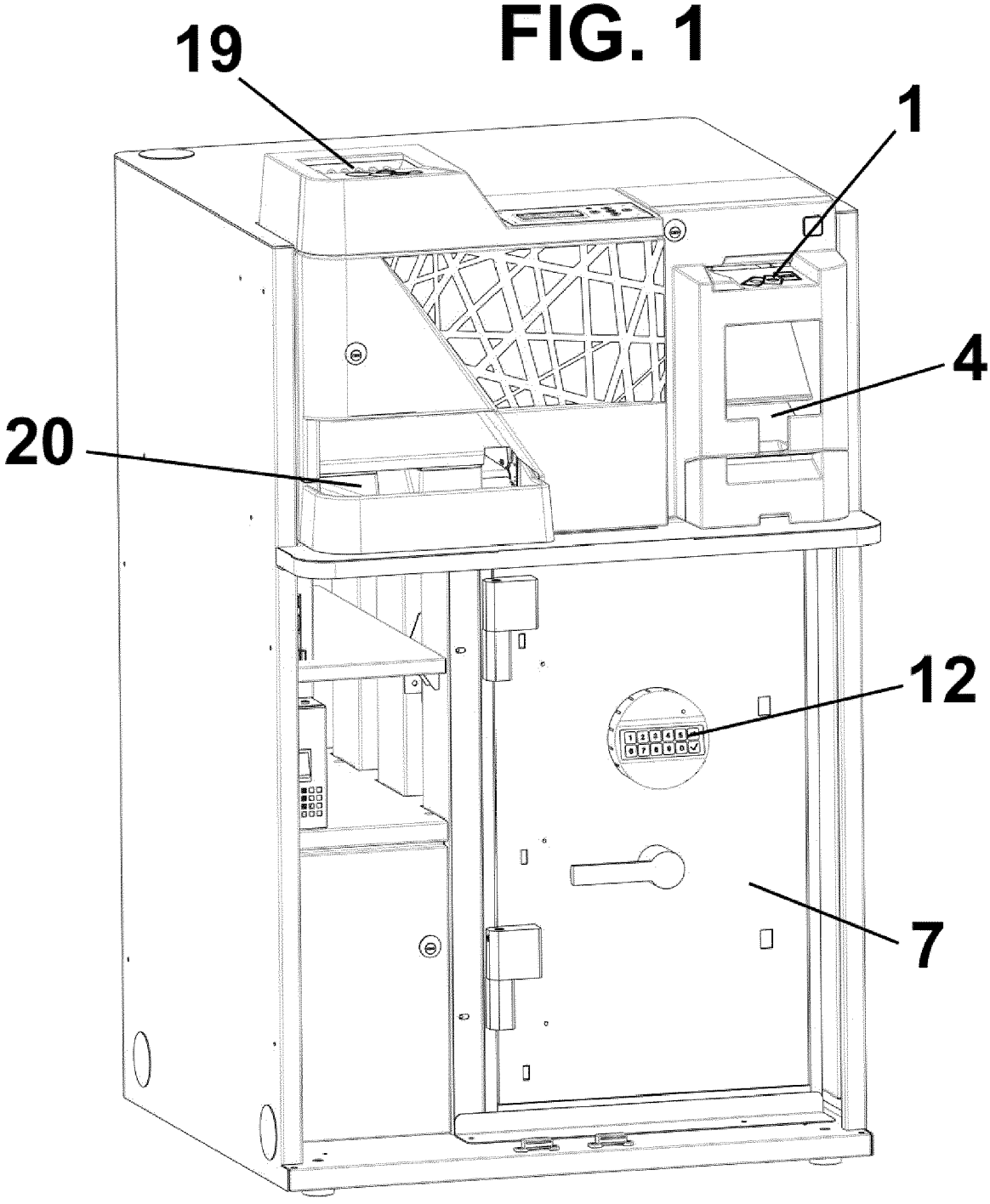


FIG. 2

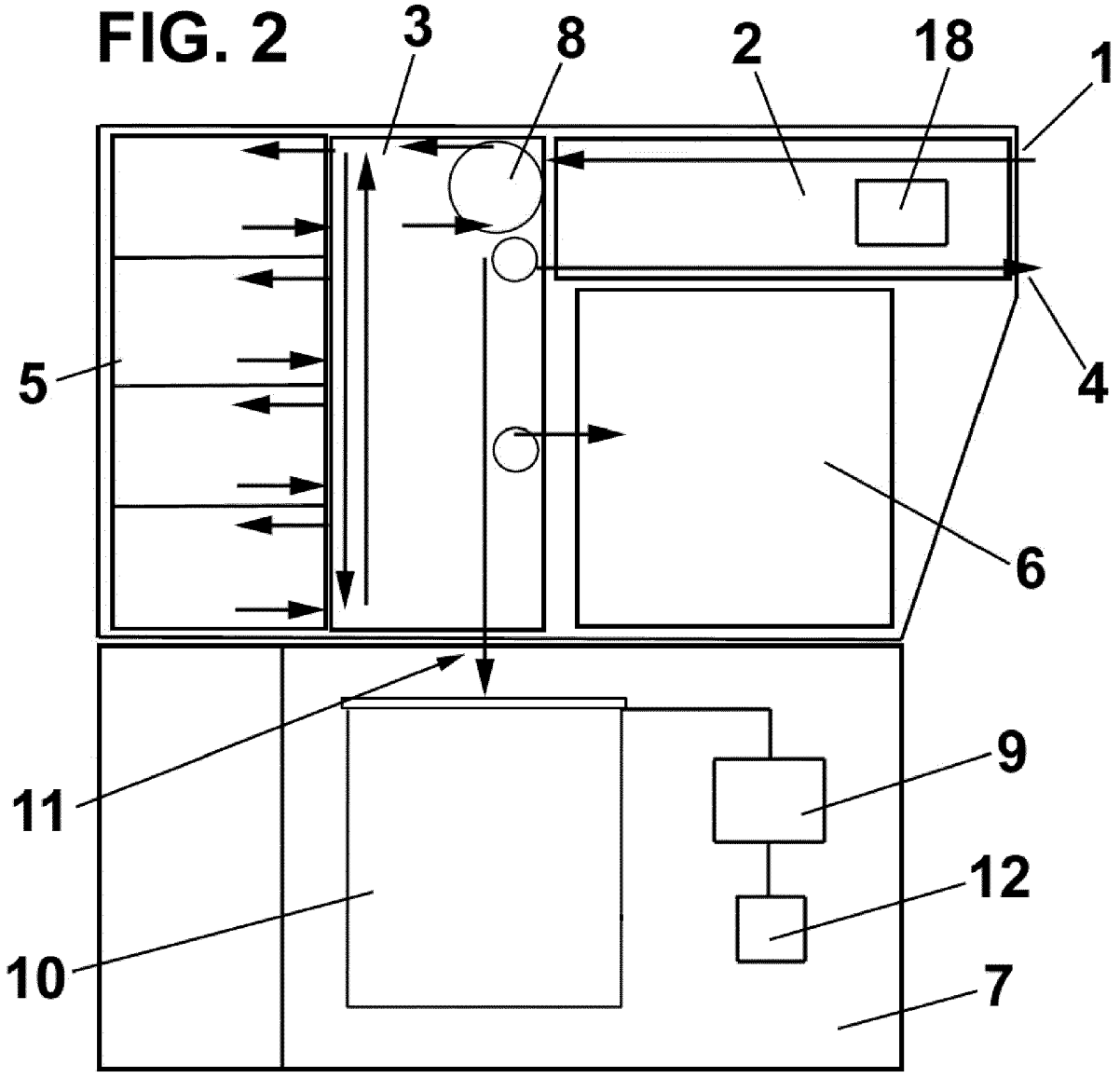


FIG. 3

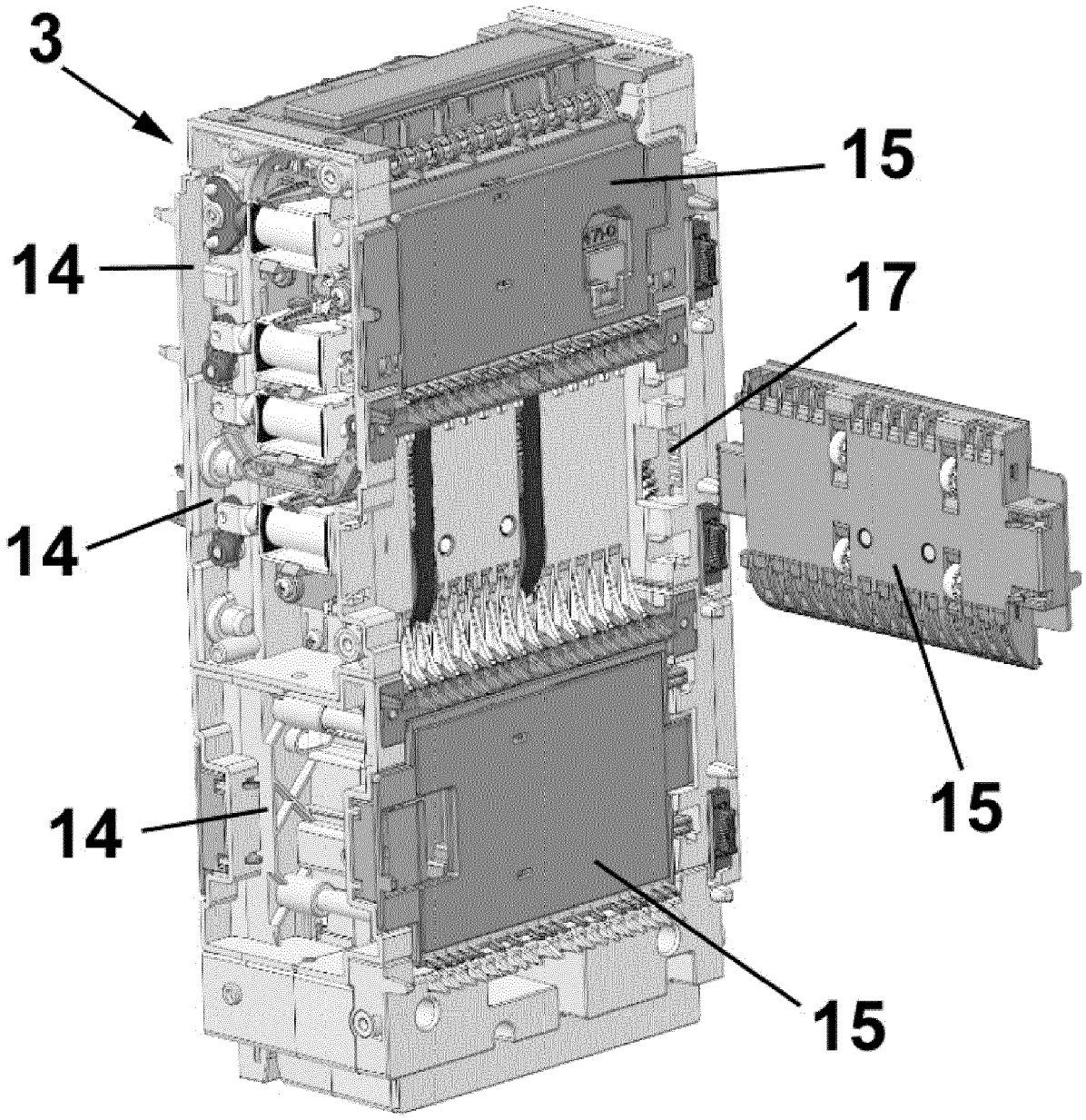


FIG. 4

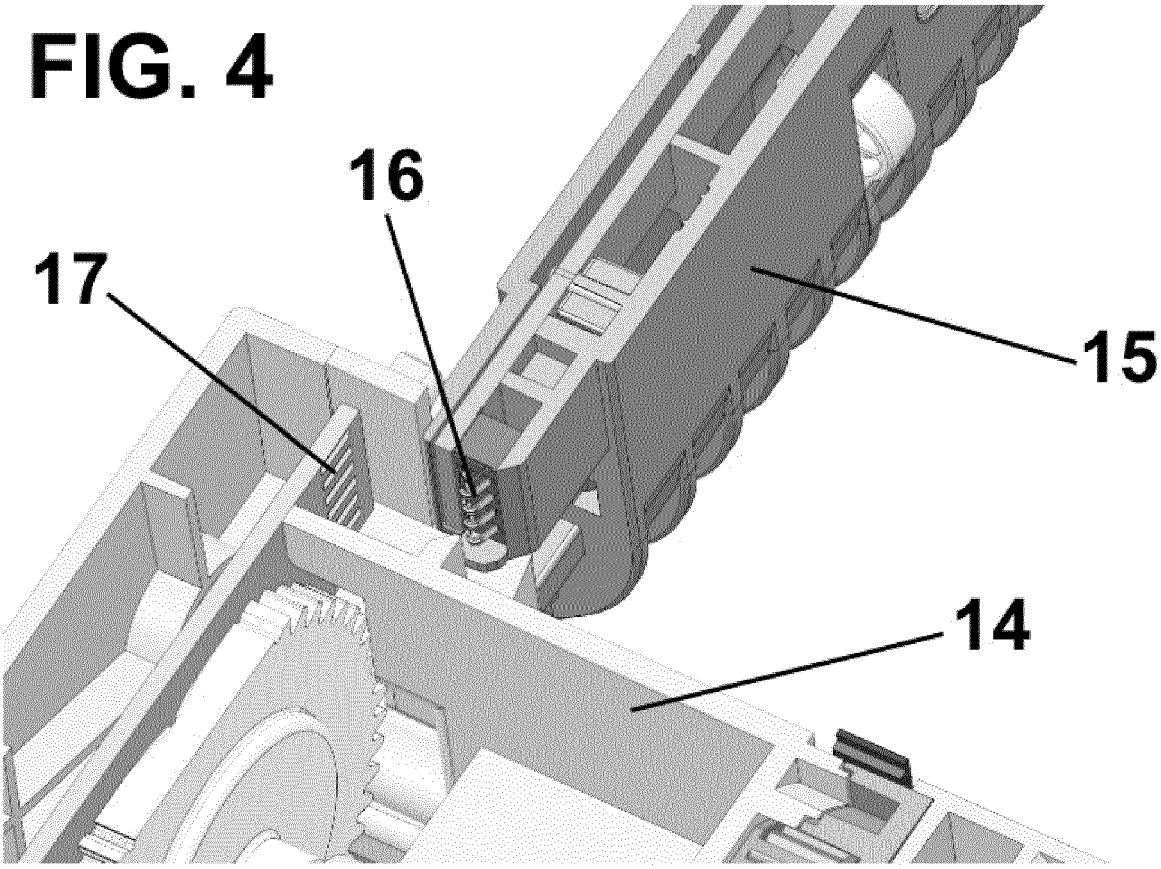


FIG. 5

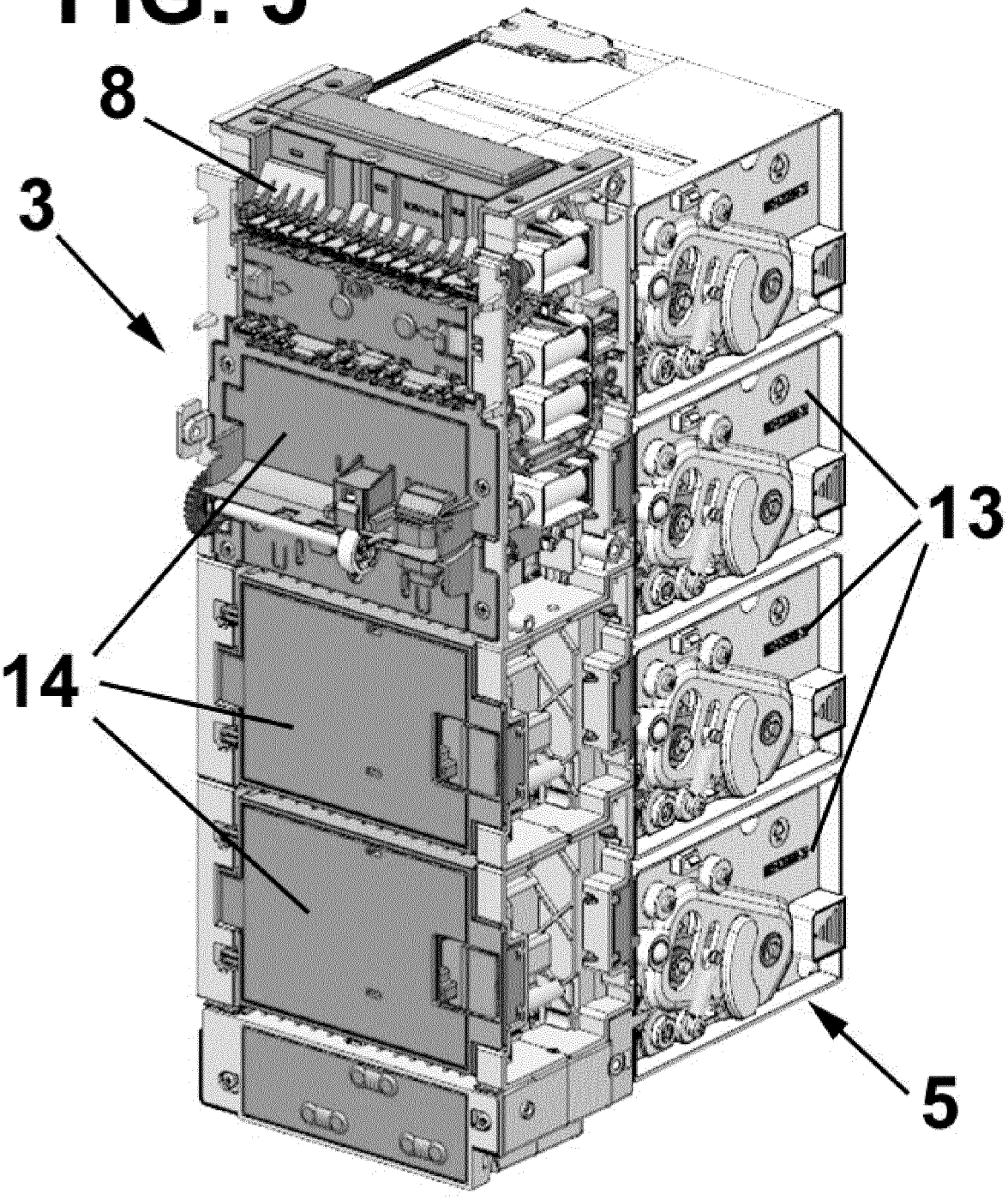
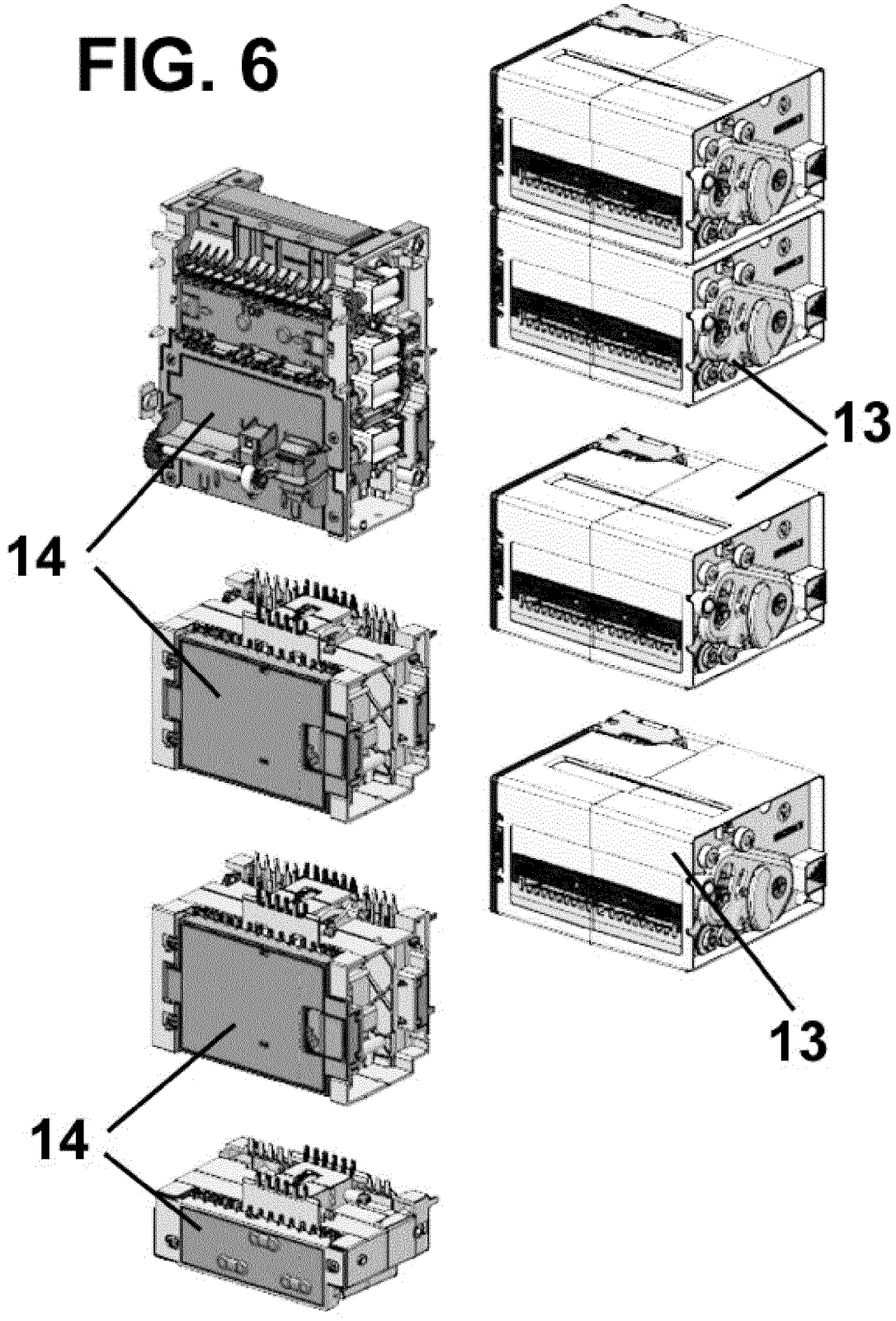


FIG. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 21 38 2624

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Place of search	Date of completion of the search	Examiner
The Hague	16 December 2021	Pañeda Fernández, J

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