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(54) **Method for managing and controlling money changing machines, and money-changing machines**

(57) A method for managing and controlling money-changing machines (1), comprising at least one deposit opening (2, 3) which conveys to suitable means of validation (4, 5), recognition and conveyance (6) for elements of currency, such as coins, banknotes and tokens, and at least one reservoir (7) for currency elements, which is connected, by means of a suitable dispensing channel (8), with at least one external dispensing compartment (9). The method provides for the reception of at least one currency element introduced into the deposit opening (2, 3) by a user; the subjection of the currency element to a check, by way of the recognition and validation means (3, 4), to verify the validity and the value/type of the currency element; the conveyance and sorting by way of the conveyance means (6) of the currency element, if it is valid, into a specific reservoir (7) which is designed to collect currency elements of the same value and type thereof, and, if it is not valid, into a respective expulsion duct which conveys it outside; the dispensing, following the withdrawal from at least one respective reservoir (7), of at least one further currency element, which has the same value as the at least one currency element introduced by the user, for its withdrawal from the dispensing compartment (9) by the user.

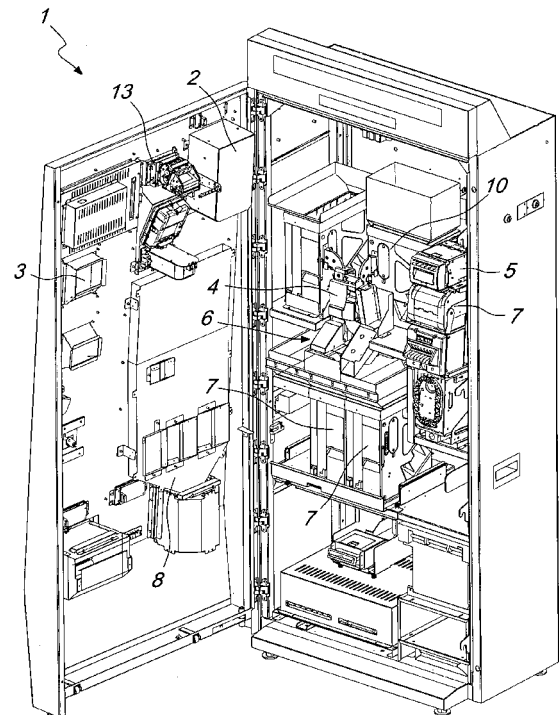


Fig. 2

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Description

[0001] The present invention relates to a method for managing and controlling money-changing machines, and money-changing machines.

[0002] Nowadays, it is easy to see the widespread use of apparatuses that offer winnings in cash, such as slot machines, poker machines and the like, located in games rooms and in casinos, but also in bars, betting offices and other public businesses.

[0003] As is known, such apparatuses are fed directly by the user, who can insert a preset number of coins or banknotes, typically only in preset denominations, in suitable slots in order to play the game and thus attempt to win a more or less substantial sum.

[0004] In some cases, the user who wishes to use these apparatuses can go to the operator of the games room or to the cash desk of the business in order to obtain the necessary cash (or tokens), thus changing different denominations of banknotes or coins.

[0005] Often, however, precisely because of the increasing spread of such apparatuses, they are located in places where no person is present who can change money, or in any case it is impractical or uneconomic to assign a person to such activity.

[0006] Therefore, precisely in order to ensure the user has the constant availability of coins or banknotes in the denominations and/or quantities required, often use is made of special machines, which are especially preloaded with determined quantities of cash and are capable of dispensing a number of coins or banknotes (in the denomination accepted by the gaming apparatuses) corresponding to the amount inserted by the user. Such machines are known as money-changing machines or change-making machines and they constitute the specific field of application of the present invention.

[0007] It should also be noted that such coin-changing or banknote-changing machines are sometimes also located in other public places, where, for a variety of practical needs, the need can arise for those present to have coins and/or banknotes available in certain denominations.

[0008] This solution is not, however, without drawbacks.

[0009] Indeed, the internal magazines which are allocated in the coin-changing and/or banknote-changing machines and are designed to accommodate cash which can be dispensed on command, have dimensions that are necessarily limited, and consequently it is not possible to ensure the constant availability of cash (except with consequent ongoing, and expensive, checks and restorations of the currency stock levels), since the risk that the coins or banknotes on hand will run out is certainly real, especially for machines that are used frequently.

[0010] The aim of the present invention is to solve the above mentioned problems, by providing a method for managing and controlling money-changing machines which ensures the constant availability of cash.

[0011] Within this aim, an object of the invention is to provide a method for managing and controlling money-changing machines, the implementation of which is economic and does not require periodic intervention by operators to restore the currency stocks.

[0012] A further object of the invention is to provide a method that can be easily obtained from elements and materials that are readily available on the market.

[0013] Another object of the invention is to provide a money-changing machine that ensures the availability of money, without requiring the constant restoring of the currency stocks.

[0014] A further object of the invention is to provide a machine that ensures a high level of reliability in operation.

[0015] A further object of the invention is to provide a money-changing machine that has a low cost and is safely applied.

[0016] This aim and these objects, as well as others which will become better evident hereinafter, are achieved by a method for managing and controlling money-changing machines, of the type comprising at least one deposit opening which conveys to suitable means of validation, recognition and conveyance for elements of currency, such as coins, banknotes and tokens, and at least one reservoir for currency elements, which is connected, by means of a suitable dispensing channel, with at least one external dispensing compartment, which consists in accepting the at least one currency element introduced into the deposit opening by a user; subjecting said currency element to a check, by way of said recognition and validation means, to verify the validity and the value/type of said currency element; conveying and sorting the currency element by means of said conveyance means, if it is valid, into a specific reservoir which is designed to collect currency elements of the same value and type as the currency element, and, if it is not valid, into a respective expulsion duct which conveys it outside; dispensing, following the withdrawal from at least one respective reservoir, at least one further currency element, which has the same value as the at least one currency element introduced by the user, for its withdrawal from said dispensing compartment by said user.

[0017] This aim and these objects are also achieved by a money-changing machine, of the type comprising at least one deposit opening which conveys to suitable means of validation, recognition and conveyance for elements of currency, such as coins, banknotes and tokens, and at least one reservoir for currency elements, which is connected, by means of a suitable dispensing channel, with at least one external dispensing compartment, characterized in that said reservoirs are a plurality, each of which is designed to contain and collect currency elements of predetermined value and type, said validation, recognition and conveyance means being controlled by a specific control and management unit for the controlled introduction of the at least one said currency element deposited by a user, which has a specific value and

type, into a respective reservoir, said control and management unit also being designed to control at least one dispenser which is arranged downstream of each specific reservoir for withdrawing and sending currency elements to said at least one dispensing compartment.

[0018] Further characteristics and advantages of the invention will become better apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the money-changing machine according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective schematic view of a possible embodiment of a money-changing machine according to the invention;

Figure 2 is a perspective schematic view of the money-changing machine of Figure 1 with its front door open.

[0019] With reference to the figures, a machine according to the invention is generally indicated with the reference numeral 1.

[0020] The optimal application of the method for managing and control according to the invention is in money-changing machines 1 comprising at least one deposit opening 2, 3 which conveys to suitable validation and recognition means 4 and 5.

[0021] With particular reference to the accompanying figures, the deposit opening 2 is a pivoting drawer that is designed to accept coins, tokens, chips and the like. Downstream of the deposit opening 2 there is a validation and recognition apparatus 4 (which is therefore capable of identifying the currency elements inserted and of distinguishing the valid elements from the non-valid elements). More specifically, downstream of the validation and recognition apparatus 4 there is a conveyance apparatus 6 through which the coins, tokens and/or chips are directed towards a suitable and specific destination.

[0022] The deposit opening 3 is designed to accept banknotes (and possibly also chips and the like, as long as they are of the laminar type). Downstream of the deposit opening 3 there is a validation and recognition apparatus 5 (which is therefore capable of identifying the currency elements inserted and of distinguishing the valid elements from the non-valid elements). The apparatus 5 is of the commercial type, and therefore known per se.

[0023] The machine 1 further comprises at least one collection reservoir 7 for currency elements, which is connected with the outside, through a suitable dispensing channel 8. Specifically, the channel 8 conveys to at least one dispensing compartment 9.

[0024] The method according to the invention consists in executing a plurality of consecutive steps.

[0025] Initially, in a first step (a), it is necessary for the machine 1 to receive the at least one currency element inserted into the deposit opening 2 and/or 3 by a user.

[0026] At this point, in a step (b), the machine 1 subjects the at least one currency element received to a

check, by way of the recognition and validation means 4 and/or 5, to verify the validity and the value/type of the currency element.

[0027] A subsequent step (c) involves the conveyance and sorting (for coins, tokens and/or chips this is done by way of the conveyance means 6) of the at least one currency element received.

[0028] In particular, this step (c) involves two possible operational paths of the machine 1: if the currency element is valid (i.e. approved by the validation and recognition apparatus 4 and/or 5 which ascertains that it is not counterfeit and assesses its currency value and type) then it will be conveyed into a specific reservoir 7 which is designed to collect currency elements of the same value and type thereof; if it is not valid (i.e. counterfeit or damaged coins, tokens, banknotes, chips) then the currency element will instead be conveyed into a respective expulsion duct which conveys it outside.

[0029] This duct conveys, in the examples shown in the accompanying figures, to the dispensing compartment 9 from which the coins, tokens and chips dispensed by the machine 1 are also withdrawn.

[0030] A step (d) involves dispensing, by means of the withdrawal from at least one respective reservoir 7 (one of the same reservoirs 7 in which the various currency elements introduced by the various users of the machine 1 are collected and subdivided), of at least one further currency element, which has the same value as the at least one currency element introduced by the user, for its withdrawal from the dispensing compartment 9 by the user.

[0031] Purely for the purposes of example, if the user inserts into the machine 1 a banknote with a token value of "10", then the machine 1, in the step (d), will simply withdraw a certain number of banknotes and coins so that the sum of their values corresponds to "10": so it might dispense ten coins of value "1", or two banknotes of value "5" or any other combination depending on the needs of the user and on the type of currency elements that are present inside its reservoirs 7.

[0032] So, in practice, the same currency elements which were inserted by other users in the past may be used to supply the specific elements (by type and value) required by a current user now.

[0033] This removes the need to continually restock the reservoirs 7, which would be done by technicians who have to maintain the machine 1, as happens with machines of the known type.

[0034] It should be noted that if the at least one reservoir 7 which contains the further currency elements of interest to the user is empty (for example because the previous user took out all the coins present therein in the previous money-changing operation), operation of the money-changing machine 1 will still be possible.

[0035] Indeed, it is possible to withdraw the further currency elements from at least one auxiliary stock container 10 (the reference numeral 10 is used in the figure to designate the auxiliary container designed to contain coins,

tokens, chips and the like; an equivalent container can also be provided for banknotes and laminar elements in general). The auxiliary stock container 10 is not fed with currency elements through the deposit openings 2 and/or 3 and it must therefore necessarily be periodically filled by the technician in charge of maintenance of the machine 1. Since this is a remote service situation (the reservoirs 7 will rarely be completely empty), the need to restock the container 10 by technicians is infrequent. It can therefore be seen that the machine 1, although ensuring a service that is particularly effective and substantially malfunction-free, necessitates rare periodic maintenance in order to guarantee the minimum maintenance of the level of currency elements in the auxiliary stock container 10.

[0036] If at least two collection reservoirs are designed to contain currency elements of the same value/type (for example if two reservoirs both contain tokens), then thanks to the method according to the invention it is possible to constantly detect the quantity of currency elements contained in each of them.

[0037] In particular, it is possible to input and withdraw currency elements to/from each reservoir in a controlled manner, following deposit, recognition, validation, conveyance and sorting operations and dispensing operations, in order to maintain a pre-established level of currency elements in each reservoir 7.

[0038] The advantage consists in having each reservoir 7 which is involved in the management of a single type (value) of currency elements constantly kept far from the limit conditions (reservoir 7 completely full and reservoir 7 empty), a condition that ensures an optimal functioning of the machine 1 and which reduces the possibilities of outage and/or malfunction to the minimum.

[0039] When a reservoir 7 for collecting currency elements of a specific value/type is empty, and at least one other reservoir 7 contains a quantity of different currency elements which has a value that is at least equal to the at least one currency element inserted into the deposit opening 2, 3 by a user, the method according to the invention makes it possible to dispense a quantity of different currency elements, by withdrawing it from the at least one other reservoir 7, that corresponds to the value of the at least one currency element inserted in the deposit opening 2, 3 by the user.

[0040] For example if the user inserted a banknote with the value "10" and asked the machine 1 for five coins with the value "2", but the reservoir 7 for collecting coins with the value "2" were empty, then the machine could dispense ten coins with the value "1" or two banknotes with the value "5". The preference for the type and value of the currency elements dispensed can be chosen by the user by means of suitable interface commands.

[0041] It should also be noted that, when a reservoir 7 for collecting currency elements of a specific value/type is completely full, the method according to the invention makes it possible to immediately redirect the at least one currency element introduced into the deposit opening 2

by the user, which has that value/type, into the respective expulsion duct 8 which conveys it outside. With specific reference to the accompanying figures, if the user inserts a banknote into the opening 3 and the reservoir 7 for the banknotes is full, then it will not be accepted by the validation apparatus 5 and so it will be immediately rejected and given back to the user.

[0042] The money-changing machine 1 differs from existing machines in that its reservoirs 7 are a plurality (at least two, although in reality there will always be more than two of them) and each of them is designed to contain and collect currency elements of a predetermined value and type.

[0043] The validation and recognition means 4 and 5 and the conveyance means 6 are controlled by a specific control and management unit (not shown in the accompanying figures) for the controlled introduction of the at least one currency element deposited by a user, which has a specific value and type, into a respective reservoir 7.

[0044] The control and management unit is also designed to control at least one dispenser (also not shown in detail in the accompanying figures) which is arranged downstream of each specific reservoir 7 for withdrawing and then sending currency elements to the dispensing compartment 9.

[0045] The control and management unit comprises at least one memory component in which the software, that is implemented in conformance with the method according to the invention, is stored. This software ensures the correct operation of the control and management unit and, therefore, of the entire machine 1.

[0046] The money-changing machine 1 comprises at least one auxiliary stock container 10 for currency elements, for withdrawing currency elements when the reservoirs 7 are empty.

[0047] The auxiliary stock container 10 is periodically filled by the technician in charge of maintenance of the machine 1, in conformance with the above explanation of the method according to the invention.

[0048] According to a particular embodiment of undoubted practical and applicative interest, the machine 1 comprises at least one display apparatus 11, of the type of a screen, a viewer, a display, at least one warning light and the like, which is controlled by the control unit, for indicating preset information intended for the user.

[0049] In particular the user, by means of the information provided by the machine 1 on the display apparatus 11, will be able to assess the possibilities for changing money offered by the machine 1 and select the preferred one.

[0050] In order to facilitate the above mentioned selection operations, the machine 1 comprises at least one communication element for the user, of the type of a keypad, a touch screen (for example the display apparatus itself could be a touch screen) and the like, for inputting commands.

[0051] The communication element is functionally con-

nected to the control and management unit in order to ensure that the selections made by the user are translated into steps of the method according to the invention which are executed by the machine 1.

[0052] The deposit opening 2 is constituted by at least one slot, a drawer for inserting coins, tokens, chips and the like.

[0053] In turn, the deposit opening 3 is instead constituted by at least one slit for inserting banknotes, chips and the like.

[0054] According to some specific embodiments it is also possible to have specific openings 12 on the machine for inserting credit cards, debit cards and the like.

[0055] In particular, the user can use his or her card (credit or debit) to withdraw cash (coins and/or banknotes) or tokens or chips directly from the machine 1, without needing to go through a credit institution.

[0056] The machine 1 can also comprise suitable printing devices 13 for printing receipts (which are issued from the slit 14) which identify the type of change operation executed and, for example, some information about the operation (the date and time, for example).

[0057] Advantageously, the present invention solves the typical problems of the known art, by means of adopting a method for managing and controlling money-changing machines 1 which ensures the constant availability of cash.

[0058] Conveniently, the method according to the invention is economic to provide and does not require periodic intervention by operators to restore currency stocks.

[0059] Conveniently, the method according to the invention is easily obtained from elements and materials that are readily available on the market.

[0060] It should obviously be emphasised that the money-changing machine 1 according to the invention ensures the availability of cash, without requiring the constant restocking of currency stocks, since it applies the method and thus obtains its advantages.

[0061] Similarly, the machine 1 ensures a high level of reliability in operation.

[0062] Of no lesser importance is the fact that the money-changing machine 1 is of low cost and safely applied.

[0063] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. In addition, all the details may be replaced by other, technically equivalent elements.

[0064] In the exemplary embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other exemplary embodiments.

[0065] In addition, it should be noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0066] In practice the materials employed, as well as

the dimensions, may be any according to requirements and to the state of the art.

[0067] Where the technical features mentioned in any claim are followed by reference numerals and/or signs, those reference numerals and/or signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference numerals and/or signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference numerals and/or signs.

Claims

1. A method for managing and controlling money-changing machines (1), of the type comprising at least one deposit opening (2, 3) which conveys to suitable means of validation (4, 5), recognition and conveyance (6) for elements of currency, such as coins, banknotes and tokens, and at least one reservoir (7) for currency elements, which is connected, by means of a suitable dispensing channel (8), with at least one external dispensing compartment (9), comprising the steps of

- a) receiving the at least one currency element introduced into the deposit opening (2, 3) by a user;
- b) subjecting said currency element to a check, by way of said recognition and validation means (4, 5), to verify the validity and the value/type of said currency element;
- c) conveying and sorting, by way of the said conveyance means (6), the currency element, if it is valid, into a specific reservoir (7) which is designed to collect currency elements of the same value and type thereof, and, if it is not valid, into a respective expulsion duct which conveys it outside;
- d) dispensing, following the withdrawal from at least one respective reservoir (7), at least one further currency element, which has the same value as the at least one currency element introduced by the user, for its withdrawal from said dispensing compartment (9) by the user.

2. The method according to claim 1, **characterized in that** it comprises, when the at least one reservoir (7) which contains the further currency elements of interest to the user is empty, the step that consists in withdrawing the further currency elements from at least one auxiliary stock container (10), said auxiliary stock container (10) being periodically filled by the technician in charge of maintenance of the machine (1).

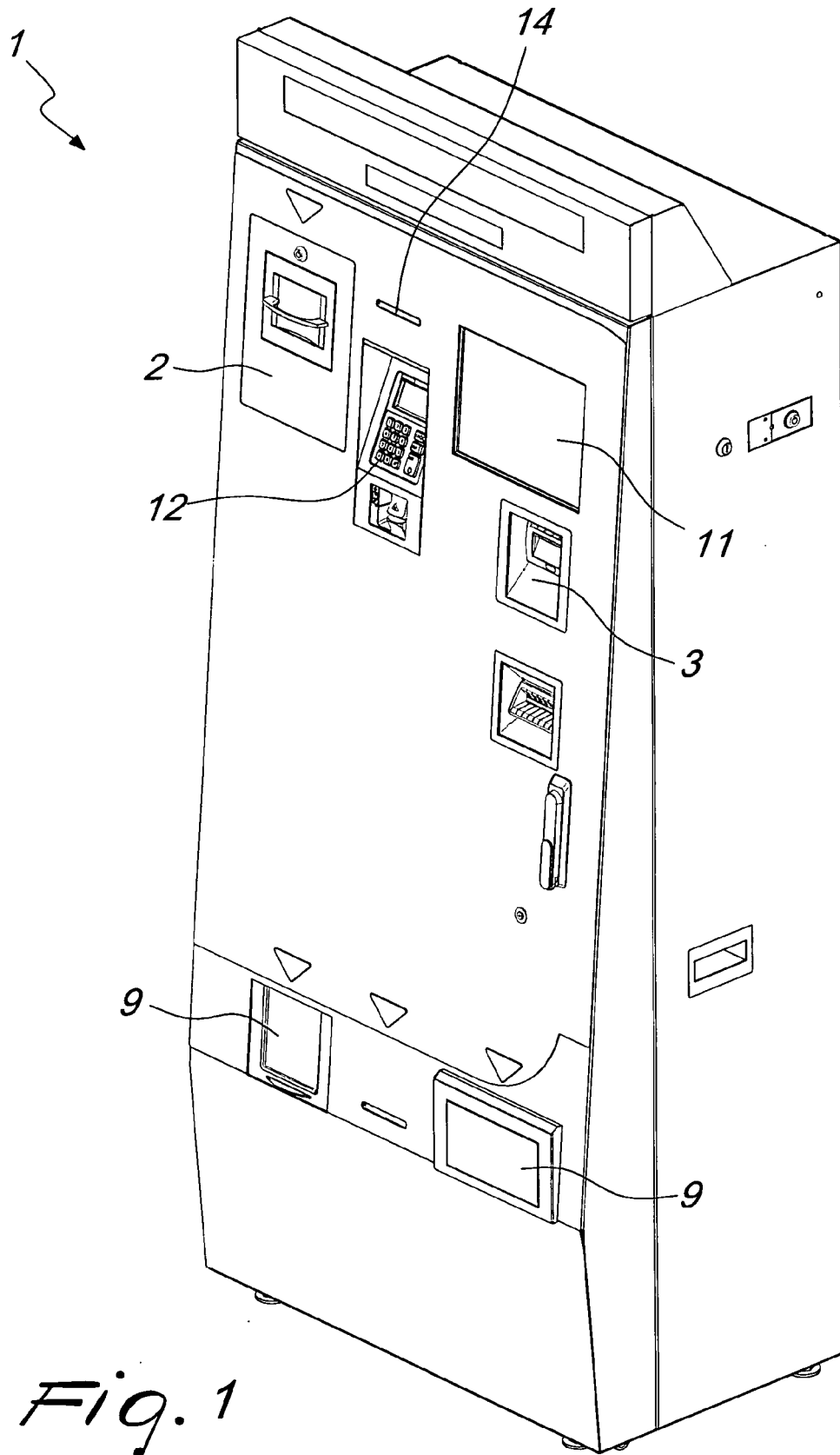
3. The method according to claim 1, **characterized in that** it comprises, when at least two collecting res-

ervoirs (7) are designed to contain currency elements of the same value/type, the steps of constantly detecting the quantity of currency elements contained in each of them; inputting and withdrawing currency elements to/from each reservoir, following deposit, recognition, validation, conveyance and sorting operations and dispensing operations, in order to maintain pre-established levels of currency elements in each reservoir (7).

4. The method according to claim 1, **characterized in that** it comprises, when a reservoir (7) for collecting currency elements of a specific value/type is empty and at least one other reservoir (7) contains a quantity of different currency elements which has an overall value that is at least equal to the at least one currency element inserted into the deposit opening by a user, the step of dispensing a quantity of different currency elements, by withdrawing it from the at least one other reservoir (7), that corresponds to the value of the at least one currency element inserted in the deposit opening (2, 3) by a user.
5. The method according to claim 1, **characterized in that** it comprises, when a reservoir (7) for collecting currency elements of a specific value/type is completely full, the step of immediately redirecting the at least one currency element introduced into the deposit opening (2, 3) by a user, which has that value/type, into the respective expulsion duct which conveys it outside.
6. A money-changing machine, of the type comprising at least one deposit opening (2, 3) which conveys to suitable means of validation, recognition (4, 5) and conveyance (6) for elements of currency, such as coins, banknotes and tokens, and at least one reservoir (7) for currency elements, which is connected, by means of a suitable dispensing channel (8), with at least one external dispensing compartment (9), **characterized in that** it comprises a plurality of reservoirs (7), each of which is designed to contain and collect currency elements of predetermined value and type, said means of validation, recognition (4,5) and conveyance (6) being controlled by a specific control and management unit for the controlled introduction of the at least one said currency element deposited by a user, which has a specific value and type, into a respective reservoir (7), said control and management unit also being designed to control at least one dispenser which is arranged downstream of each specific reservoir (7) for withdrawing and sending currency elements to said at least one dispensing compartment (9).
7. The money-changing machine according to claim 6, **characterized in that** it comprises at least one aux-

iliary stock container (10) for currency elements, for the withdrawal of currency elements when said reservoirs (7) are empty, said auxiliary stock container (10) being periodically filled by the technician in charge of maintenance of the machine (1).

8. The money-changing machine according to claim 6, **characterized in that** it comprises at least one display apparatus (11), such as a screen, a viewer, a display, at least one warning light and the like, which is controlled by said control unit, for indicating preset information intended for the user.
9. The money-changing machine according to claim 6, **characterized in that** it comprises at least one communication element for the user, such as a keypad, a touch screen and the like, for inputting commands, said communication element being functionally connected to said control and management unit.
10. The money-changing machine according to claim 6, **characterized in that** said deposit opening (2) is constituted by at least one component of the type comprising a slot, a drawer and the like, for inserting coins, tokens, chips and the like.
11. The money-changing machine according to claim 6, **characterized in that** said deposit opening (3) is constituted by at least one slit for inserting banknotes, credit cards, debit cards, chips and the like.



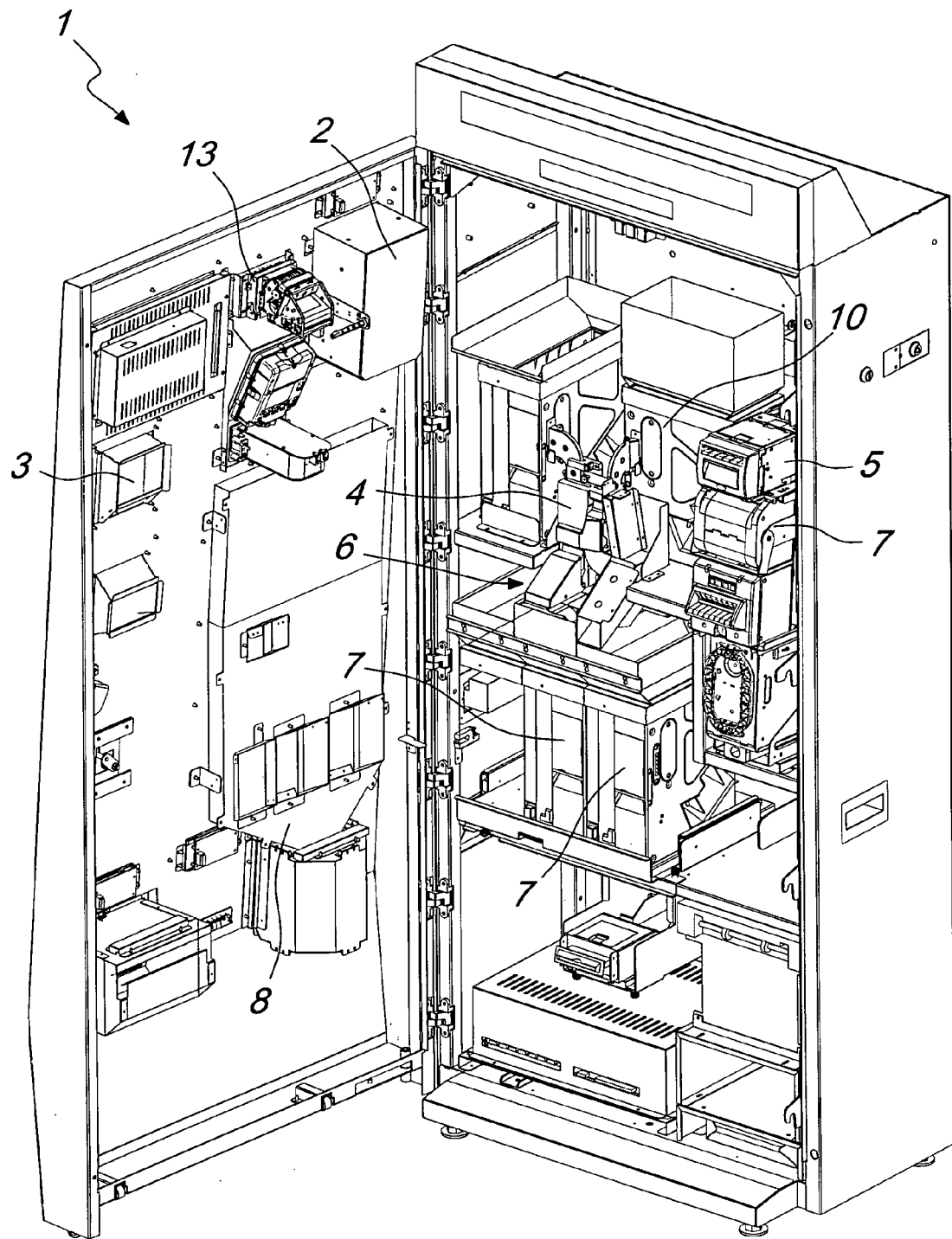


Fig. 2



EUROPEAN SEARCH REPORT

Application Number
EP 11 42 5012

DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 June 2011	Examiner Espuela, Vicente
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			

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

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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
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21-06-2011

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