(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 187 360 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
19.05.2010 Bulletin 2010/20

(21) Application number: **07806948.1**

(22) Date of filing: **07.09.2007**

(51) Int Cl.:
G07D 9/00 *(2006.01)*

(86) International application number:
PCT/JP2007/067516

(87) International publication number:
WO 2009/031237 (12.03.2009 Gazette 2009/11)

(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: **Glory Ltd.**
Himeji-shi,
Hyogo 671-8567 (JP)

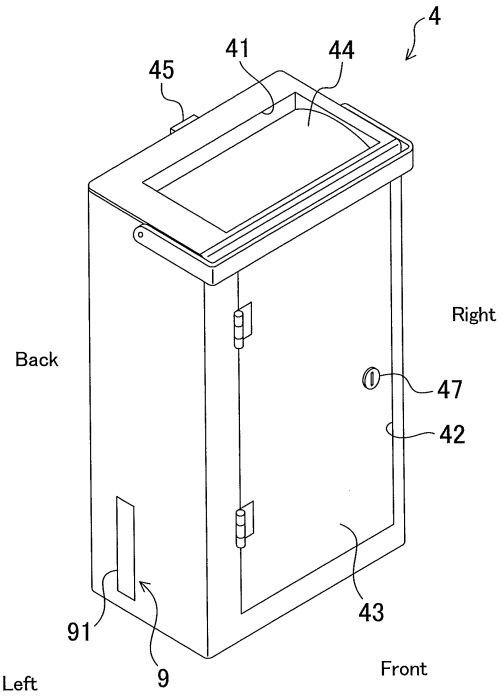
(72) Inventor: **DOI, Kazuhiro**
Himeji-shi
Hyogo 670-8567 (JP)

(74) Representative: **Schwabe - Sandmair - Marx**
Patentanwälte
Stuntzstraße 16
81677 München (DE)

(54) **MONEY-HOUSING CASSETTE AND MONEY PROCESSOR**

(57) A currency storage cassette 4 includes a main body which has a receiving opening 41 and a pickup opening 42 and in which a currency deposited through the receiving opening 41 is stored, and a display unit 9 attached to the main body. The display unit 9 displays a display mode that is switched among a plurality of display modes including at least first and second display modes and that is visible from the outside. The display mode of the display unit 9 is automatically switched to another display mode according to a state of the main body.

FIG.7



EP 2 187 360 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to currency storage cassettes and currency handling apparatus having the currency storage cassettes.

BACKGROUND ART

[0002] Currency handling apparatus placed at retail stores, such as supermarkets, for receiving sale proceeds of the retailers is known (see, e.g., Patent Document 1). This currency handling apparatus includes a currency storage cassette (a cashbox cassette). The currency storage cassette is detachably mounted in a drawer unit which can be drawn from the housing of the currency handling apparatus. As a currency depositing process, the currency handling apparatus distinguishes, for example, whether the currency is genuine or counterfeit and whether the currency is fit or unfit (i.e., whether the currency is a fit banknote that is suitable for circulation, or an unfit banknote that is not suitable for circulation because of tears, soiling, etc.) and after that only acceptable currencies are stored in the currency storage cassette.

[0003] The cassette in which the currencies are accumulated is removed from the currency handling apparatus by a person in charge from a cash-in-transit (CIT) company contracted in advance, and is transported to a cash processing center of the CIT company (collection of cassettes). At the cash processing center, the currencies are taken from the cassette, counted, and checked by comparing the count result to data about deposited currencies which is provided to the cash processing center separately by a journal, for example.

[0004] The empty cassette from which the currencies have been taken is transported by the CIT company, and is mounted in the currency handling apparatus again. In fact, the cassette in the currency handling apparatus is replaced with an empty cassette when the cassette in the currency handling apparatus is removed from the currency handling apparatus.

[0005] For example, Patent Document 2 shows currency handling apparatus which enables a visual check to distinguish whether currencies are stored in a cassette or the cassette is empty, when the cassette is removed from the currency handling apparatus. This currency handling apparatus is configured such that the currency receiving opening of a cassette is closed by a shutter in the case where currencies are accumulated in the cassette and such that the opening is open in the case where the cassette is empty, when the drawer unit is drawn. With this structure, empty cassettes are prevented from being collected from the currency handling apparatus, and the cassettes can be collected more efficiently.

[0006] Patent Document 3 shows an example currency storage cassette which includes a display panel for displaying the denominations of the banknotes stored in the currency storage cassette.

[0007] Many currency storage cassettes collected from currency handling apparatus s at various locations are gathered at the cash processing center. Here, it is impossible to distinguish between a cassette which is not yet checked, i.e., from which currency has not been taken, and a cassette which has been checked, i.e., from which currency has been taken. Thus, for example, a cassette which has been checked may be mistaken for a cassette which is not yet checked, and the empty cassette is opened to find no currency. This means that vain efforts may be made, and efficiency of the cash settlement is reduced.

[0008] In contrast, if a cassette which is not yet checked is mistaken for a cassette which has been checked, it may result in inconsistency between data about the deposited currencies and cash in the drawer. Moreover, a cassette in which currencies are still stored may be transported from the cash processing center to a retail store and mounted in a currency handling apparatus placed at the retail store.

CITATION LIST

[0009]

PATENT DOCUMENT 1: Japanese Patent No. 3340176
PATENT DOCUMENT 2: Japanese Patent No. 3247275
PATENT DOCUMENT 3: Japanese Patent Publication No. 7-259434

SUMMARY OF THE INVENTION

TECHNICAL PROBLEM

[0010] According to conventional currency storage cassettes, as described above, it is impossible to visually distinguish whether the conventional currency storage cassettes are checked or not. Therefore, the currency storage cassettes may be mixed up and mistaken.

[0011] The present invention was made in view of the above problems, and it is an object of the invention to make it possible to visually distinguish whether a currency storage cassette is checked or unchecked.

SOLUTION TO THE PROBLEM

[0012] According to one aspect of the present invention, a currency storage cassette for storing a currency includes: a main body which has a receiving opening and a pickup opening and in which a currency deposited through the receiving opening is stored; and a display unit which is attached to the main body and which displays a display mode that is switched among a plurality of display modes including at least first and second dis-

play modes and that is visible from the outside, wherein the display mode is automatically switched to another display mode according to a state of the main body.

[0013] The currency storage cassette having this structure includes a display unit. The display unit displays a display mode by automatically switching among a plurality of display modes including first and second display modes according to a state of the main body. Thus, it is possible to know the state of the main body by looking at the information displayed on the display unit. Here, the term "automatically" refers to not switching the display mode of the display unit directly by hand. For example, switching the display mode of the display unit through normal operation of the currency storage cassette, such as removing the banknotes from the main body, without touching the display unit is an "automatic" operation.

[0014] The currency storage cassette may be such that the first display mode indicates a checked state in which no currency is stored in the main body as a result of removal of the currency through the pickup opening, and the second display mode indicates an unchecked state in which a currency is stored in the main body. That is, the "state of the main body" includes whether the main body is checked or unchecked. In this case, a currency storage cassette which has been checked and a currency storage cassette which is not yet checked are visually distinguishable from each other by the display unit.

[0015] Alternatively, the currency storage cassette may be such that the first display mode indicates that no currency is stored in the main body, and the second display mode indicates that a currency is stored in the main body. That is, the "state of the main body" includes whether the main body stores a currency or not. In this case, a currency storage cassette which stores a currency and a currency storage cassette which stores no currency are visually distinguishable from each other by the display unit.

[0016] Further, the "state of the main body" includes the type of the currency stored in the main body, such as denomination and currency unit.

[0017] It is preferable that the main body is detachably mounted in a mounting unit of the currency handling apparatus, and a currency is deposited in the main body through the receiving opening while the main body is mounted in the mounting unit, and the display mode of the display unit is switched from the first display mode to the second display mode after the main body is mounted in the mounting unit until the main body is removed from the mounting unit.

[0018] The currency storage cassette may be such that the display mode of the display unit is switched from the first display mode to the second display mode in conjunction with a movement of the main body being mounted into the mounting unit.

[0019] According to this structure, the display mode of the display unit is automatically switched in conjunction with an operation conducted by a person in charge when he/she mounts the main body in the mounting unit. Thus, the display unit indicates the second display mode when the main body is removed from the mounting unit. This means that the display mode of the display unit is switched at an appropriate time, and accurately indicates the state of the cassette, in the case where the first display mode indicates a checked state and the second display mode indicates an unchecked state, and in the case where the first display mode indicates that no currency is stored in the main body and the second display mode indicates that a currency is stored in the main body.

[0020] The currency storage cassette may be such that the display mode of the display unit is switched from the first display mode to the second display mode by control from the currency handling apparatus while the main body is mounted in the mounting unit.

[0021] According to this structure, the display mode of the display unit can be switched at an arbitrary time while the main body is mounted in the mounting unit. Thus, the display unit indicates the second display mode when the main body is removed from the mounting unit.

[0022] It is preferable that the display mode of the display unit is switched from the second display mode to the first display mode when the currency in the main body is removed through the pickup opening after the main body is removed from the mounting unit.

[0023] The currency storage cassette may further include a handling mechanism unit which is located in the main body and which is manually moved for removal of the currency stored in the main body through the pickup opening, wherein the display mode of the display unit is switched from the second display mode to the first display mode in conjunction with the movement of the handling mechanism unit.

[0024] According to this structure, the display mode of the display unit is automatically switched from the second display mode to the first display mode in conjunction with an operation conducted by a person in charge when he/she removes the currency stored in the main body through the pickup opening, that is, in conjunction with an operation included in a cash settlement. This means that the display mode of the display unit is switched at an appropriate time, and accurately indicates the state of the cassette, in the case where the first display mode indicates a checked state and the second display mode indicates an unchecked state, and in the case where the first display mode indicates that no currency is stored in the main body and the second display mode indicates that a currency is stored in the main body.

[0025] The currency storage cassette may be such that the display unit is mechanically linked with the movement of the handling mechanism unit, thereby switching the display mode of the display unit from the second display mode to the first display mode.

[0026] The currency storage cassette may be such that the main body stores a banknote; the handling mechanism unit is a stage which is movable, in the main body, in a reciprocating manner in a direction along which banknotes are deposited through the receiving opening, and

which holds a stack of the banknotes; the stage is manually moved to a predetermined pickup position which is away from the receiving opening to remove the banknotes held on the stage; and the display unit engages with the stage when the stage is moved to the pickup position, thereby switching the display mode of the display unit from the second display mode to the first display mode.

[0027] According to another aspect of the present invention, a currency handling apparatus for handling a currency includes: a currency storage cassette which has a receiving opening and a pickup opening and in which a currency is stored; a mounting unit in which the currency storage cassette is detachably mounted; a handling section for depositing a currency in the currency storage cassette mounted in the mounting unit through the receiving opening; a display unit which is attached to the currency storage cassette and which displays a display mode that is switched among a plurality of display modes including at least first and second display modes and that is visible from the outside; and a switching unit for switching the display mode of the display unit according to a state of the currency storage cassette.

ADVANTAGES OF THE INVENTION

[0028] According to the present invention, a currency storage cassette is provided with a display unit, and therefore, it is possible to visually distinguish whether the currency storage cassette is checked or unchecked. This can prevent a checked cassette and an unchecked cassette from being mixed up and mistaken.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029]

[FIG. 1] FIG. 1 is an oblique view of a general structure of a currency handling apparatus.
[FIG. 2] FIG. 2 is a block diagram of a structure relating to control of the currency handling apparatus.
[FIG. 3] FIG. 3 is a schematic view of a structure of a banknote handling section
[FIG. 4] FIG. 4 is a schematic view of a structure of a coin handling section.
[FIG. 5] FIG. 5 shows a general configuration of the system, which includes the currency handling apparatus, for receiving sale proceeds.
[FIG. 6] FIG. 6 is an example screen displaying a result of comparison made by a POS server.
[FIG. 7] FIG. 7 is an oblique view of a banknote storage cassette.
[FIG. 8] FIG. 8 is an oblique view of the banknote storage cassette.
[FIG. 9] FIG. 9 is a side view of the banknote storage cassette part of which is cutaway.
[FIG. 10] FIG. 10 is a plan view of the banknote storage cassette part of which is cutaway.
[FIG. 11] FIG. 11 is an oblique view of a display unit.
[FIG. 12] FIG. 12 is a flowchart relating to a cash settlement, showing how the banknote storage cassette is handled and showing the switching of a display mode displayed on the banknote storage cassette.
[FIG. 13] FIG. 13 shows side views and plan views for illustrating the process in which a display information of the display unit is changed from unchecked to checked state.
[FIG. 14] FIG. 14 shows side views and plan views for illustrating the process in which a display information of the display unit is changed from checked to unchecked state.
[FIG. 15] FIG. 15 is an oblique view of a banknote storage cassette which includes a display unit having a structure different from the structure of the display unit shown in FIG. 7.
[FIG. 16] FIG. 16 shows a structure of the display unit shown in FIG. 15 and the switching of a display mode of the display unit.
[FIG. 17] FIG. 17 is a schematic view showing an engagement state of a banknote storage cassette and a coin storage cassette.
[FIG. 18] FIG. 18 is a schematic view showing an engagement state of a banknote storage cassette and a coin storage cassette that is different from the engagement state shown in FIG. 17.
[FIG. 19] FIG. 19 is an oblique view of a banknote storage cassette having a fit banknote storage section and an unfit banknote storage section.
[FIG. 20] FIG. 20 is an oblique view of a banknote storage cassette having a fit banknote storage section and an unfit banknote storage section.
[FIG. 21] FIG. 21 is a schematic view of a structure for depositing unfit banknotes in an unfit banknote storage section of a currency handling apparatus.
[FIG. 22] FIG. 22 is a schematic view of a structure for depositing unfit banknotes that is different from the structure shown in FIG. 21.
[FIG. 23] FIG. 23 is a schematic view of another structure of the banknote handling section.

DESCRIPTION OF REFERENCE CHARACTERS

[0030]

1	Currency handling apparatus
2	Handling section
311	Mounting unit
4	Note storage cassette
41	Receiving opening
42	Pickup opening
46	Stage
5	Coin storage cassette
7	Note storage cassette
77	Pickup opening
9	Display unit

DESCRIPTION OF EMBODIMENTS

[0031] An embodiment of the present invention will be described in detail hereinafter, based on the drawings. Essentially, the following descriptions of the preferable embodiment are merely examples which are not intended to limit the present invention, its application, or its range of use.

(General Structure of Currency Handling Device)

[0032] FIG. 1 shows an oblique view of a currency handling apparatus 1 according to an embodiment. As shown in FIG. 5, the currency handling apparatus 1 is a so-called cash depositing machine placed at retail stores such as supermarkets. The currency handling apparatus 1 performs at least a counting process in which currencies are counted, and a transfer process in which the counted currencies are stored in currency storage cassettes 4 and 5 and are transferred from the retailer to a CIT company contracted in advance. The CIT company performs a collecting process by replacing the currency storage cassettes 4 and 5 with empty currency storage cassettes 4 and 5 and collecting the currency storage cassettes 4 and 5.

[0033] The currency handling apparatus 1 includes a handling section 2 and a cashbox section 3. The handling section 2 and the cashbox section 3 are arranged such that the handling section 2 is located above the cashbox section 3. In this example, the handling section 2 is controlled by the retailer, and the cashbox section 3 is controlled by the CIT company. The retailer cannot touch the inside of the cashbox section 3.

[0034] As shown in FIG. 2, the handling section 2 is configured to include: a banknote handling section 21 for handling banknotes; a coin handling section 22 for handling coins; a communication section 23 for receiving and transmitting data via a communication line 64, described later; a display 24 for displaying various information; an operating section 25 apparatus 1; a printer 26 for printing a journal etc., described later; a card reader 27 which performs an authentication process for verifying the identity of the user who executes the various processes using the currency handling apparatus 1; and a controller 28 for controlling these devices.

[0035] The banknote handling section 21 is located at a right portion of the housing of the currency handling apparatus 1 (a right portion of the currency handling apparatus 1 when viewed from the front). As shown in FIGS. 1-3, the banknote handling section 21 includes: abanknote receiving unit 211 having a banknote receiving opening 210 through which banknotes are deposited; a banknote recognition unit 212 for recognizing the banknotes deposited in the banknote receiving section 211; a banknote escrow unit 213 for temporarily holding the banknotes after recognition; a banknote reject unit 214 for returning a banknote based on the result of the recognition by the banknote recognition unit 212; and a transport path for connecting the banknote receiving unit 211, the banknote recognition unit 212, the banknote escrow unit 213, and the banknote reject unit 214 together, and includes: a banknote transport unit 215 for transporting a banknote with its short sides parallel to the transport path; and a banknote storage cassette 4 which is detachably mounted in the currency handling apparatus 1. Here, the transport of a banknote with its short sides parallel to the transport path means that a rectangular banknote having long sides and short sides is transported with its short sides along the transport direction.

[0036] The banknote receiving opening 210 is an opening into which a stack of banknotes is deposited. The banknote receiving opening 210 is provided at an upper end portion of the front face of the housing of the currency handling apparatus 1, and is open forwardly upward and horizontally. In FIG. 1, the banknote receiving opening 210 is closed by an openable door.

[0037] Although not shown, the banknote receiving unit 211 includes a feeding mechanism which delivers the plurality of banknotes deposited in the banknote receiving opening 210 to the banknote recognition unit 212, one by one.

[0038] The banknote recognition unit 212 at least identifies the denomination of each banknote delivered from the banknote receiving unit 211, whether the each banknote is genuine or counterfeit, and whether the each banknote is fit or unfit. Particularly in this embodiment, the currency handling apparatus 1 is configured to be able to handle currencies of different countries. Therefore, the banknote recognition unit 212 identifies the kind of the currencies.

[0039] The banknote escrow unit 213 is a section to which banknotes identified by the banknote recognition unit 212 are transported and in which the banknotes are temporarily held. The banknote escrow unit 213 is provided at a location above the banknote storage cassette 4 in the housing of the currency handling apparatus 1. The banknote escrow unit 213 has a banknote return opening 216 which is provided at a generally central location of the front face of the housing along a vertical direction of the housing and which is open toward the front. In FIG. 1, the banknote return opening 216 is closed by an openable door. The openable door is locked/unlocked by the controller 28.

[0040] The banknotes held in the banknote escrow unit 213 are returned to the user or dropped in the banknote storage cassette 4, depending on the process executed by the currency handling apparatus 1. That is, in the case where the currency handling apparatus 1 performs, for example, a counting process, the openable door of the banknote escrow unit 213 is unlocked after the counting of the banknotes, and the banknotes held in the banknote escrow unit 213 are returned to the user. In contrast, in the case where the currency handling apparatus 1 performs, for example, a transfer process, the banknotes held in the banknote escrow unit 213 are dropped in the banknote storage cassette 4 through the receiving open-

ing 41 formed in the top surface of the banknote storage cassette 4. A mechanism for dropping banknotes from the banknote escrow unit 213 to the banknote storage cassette 4 will be described in detail later.

[0041] The banknote reject unit 214 is a section to which a banknote (e.g., an unfit note) identified as being unacceptable by the banknote recognition unit 212 is transported, and from which the unfit banknote etc. is returned to the user. The banknote reject unit 214 has a banknote reject opening 218 which is provided at a location between the banknote receiving opening 210 and the banknote return opening 216 in the front face of the housing and which is open toward the front. The banknote reject unit 214 is connected to a transport path branched from a transport path combining the banknote recognition unit 212 and the banknote escrow unit 213. The banknote transport unit 215 switches between the transport paths, depending on the result of recognition by the banknote recognition unit 212, and thereby, unfit banknotes are transported to the banknote reject unit 214.

[0042] The coin handling section 22 is located at a left portion of the housing of the currency handling apparatus 1 (an upper left portion of FIG. 1). As shown in FIGS. 1, 2 and 4, the coin handling section 22 includes: a coin receiving opening 220 which is formed in the top surface of the housing of the currency handling apparatus 1 and which is open upward; a reservoir hopper unit 221 which communicates with the coin receiving opening 220 and into which coins are poured; a coin recognition unit 222 for recognizing the coins dispensed from the reservoir hopper unit 221; a coin escrow unit 223 for temporarily holding the coins after recognition; a coin reject unit 224 for returning a coin based on the result of the recognition by the coin recognition unit 222; and a transport path for connecting the reservoir hopper unit 221, the coin recognition unit 222, the coin escrow unit 223, and the coin reject unit 224 together, and includes: a coin transport unit 225 for transporting a coin along the transport path; and a coin storage cassette 5 which is detachably mounted in the currency handling apparatus 1. In FIG. 1, the coin receiving opening 220 is closed by an openable door.

[0043] The reservoir hopper unit 221 is a section which accumulates coins poured therein through the coin receiving opening 220, and which dispenses the coins, one by one, to the coin recognition unit 222.

[0044] The coin recognition unit 222 at least identifies the denomination of each coin dispensed from the reservoir hopper unit 221, whether the each coin is genuine or counterfeit, whether the each coin is fit or unfit, and the kind of the currency.

[0045] The coin escrow unit 223 is a section to which coins after recognition by the coin recognition unit 222 are transported and which temporarily holds the coins. The coin escrow unit 223 is connected to a chute 226 branched from the transport path connecting the coin recognition unit 222 and the coin reject unit 224. A gate 227 is provided at a location where the chute 226 is branched and connected. The gate 227 is opened and closed based on the result of recognition by the coin recognition unit 222, and thereby acceptable coins are transported to the coin escrow unit 223. The coin escrow unit 223 is configured to be able to move forward and backward in the housing. When the coin escrow unit 223 moves forward, the coin escrow unit 223 is positioned at a location above a return box 228. When the coin escrow unit 223 moves backward, the coin escrow unit 223 is positioned at a location above the coin storage cassette 5. The return box 228 is provided at a generally central location of the front face of the housing along a vertical direction of the housing, and can be pulled out in a forward direction.

[0046] The coins held in the coin escrow unit 223 are returned to the user or dropped in the coin storage cassette 5, depending on the process executed by the currency handling apparatus 1. That is, in the case where the currency handling apparatus 1 performs, for example, a counting process, the coin escrow unit 223 moves forward after the counting of the coins, and the coins held in the coin escrow unit 223 are dropped in the return box 228. In contrast, in the case where the currency handling apparatus 1 performs, for example, a transfer process, the coin escrow unit 223 moves backward after the counting of the coins, and the coins held in the coin escrow unit 223 are dropped in the coin storage cassette 5 through the receiving opening 51 formed in the top surface of the coin storage cassette 5.

[0047] The coin reject unit 224 is a section to which coins having been identified by the coin recognition unit 222 as being unacceptable because they are, for example, currencies of different countries, and from which the coins are returned to the user. The coin reject unit 224 has a coin reject opening 229 which is provided at a location of the front face of the housing above the return box 228, and which is open toward the front.

[0048] The display 24 is made of such as a liquid crystal panel. The display 24 is provided at a location of the top surface of the housing on the rear side of the banknote receiving opening 210, and faces upward.

[0049] The operating section 25 includes a plurality of push button type control keys. The operating section 25 is provided at a location of the top surface of the housing adjacent to a lateral side of the display 24.

[0050] The printer 26 is, for example, a thermal type printer. The printer 26 is provided at a location of the top surface of the housing on the rear side of the coin receiving opening 220.

[0051] The card reader 27 is a magnetic card reader having a slit extending vertically. The card reader 27 is provided at a location of the front surface of the housing on the right side of the banknote receiving opening 210 and the banknote reject opening 218.

[0052] As shown in FIG. 1, the cashbox section 3 includes a drawer unit 31 which can be pulled out forward from the housing. The drawer unit 31 is locked unless it is unlocked to be pulled out for a collecting process described later. Two mounting units 311 and 312, each be-

ing open upward, are provided at predetermined locations within the drawer unit 31 (see FIGS. 3 and 4). The banknote storage cassette 4 and the coin storage cassette 5 (hereinafter collectively referred to as "cassettes") are mounted in the mounting units 311 and 312, respectively, by inserting them from above, and removed from the mounting units 311 and 312 by pulling them up. That is, each of the cassettes 4 and 5 is removable from the drawer unit 31.

[0053] Although not shown in detail, the coin storage cassette 5 has a generally rectangular box-like shape, and has an accommodation space for accommodating coins. The coin storage cassette 5 also has the receiving opening 51 through which coins are dropped from the coin escrow unit 223, and an opening for removing the coins in the coin storage cassette 5 after the coin storage cassette 5 is removed from the drawer unit 31. As shown in FIG. 17, a side surface of the coin storage cassette 5 has an engagement recess 52, described in detail later, which extends vertically for engaging with the banknote storage cassette 4.

[0054] As shown in FIGS. 7 and 8, the banknote storage cassette 4 has a generally rectangular box-like shape, and has an accommodation space for accommodating banknotes. For convenience of understanding, a handle is not shown in FIG. 8. The top surface of the banknote storage cassette 4 is provided with a rectangular receiving opening 41 having a size which allows banknotes to pass therethrough. The front surface of the banknote storage cassette 4 (the surface facing toward a lower right side of FIG. 7) is provided with a pickup opening 42 which can be opened/closed by an openable door 43. The surface opposed to the front surface will hereinafter be referred to as "rear surface." The surface facing toward a lower left side of FIG. 7 will be referred to as "left side surface" and the surface opposed to the left side surface will be referred to as "right side surface."

[0055] The receiving opening 41 is an opening for allowing banknotes dropped from the banknote escrow unit 213 to pass therethrough while the banknote storage cassette 4 is mounted in the drawer unit 31. A shutter 44 is attached to the receiving opening 41, and the receiving opening 41 can be opened/closed by the shutter 44. The shutter 44 is controlled by the controller 28 of the currency handling apparatus 1 to open the receiving opening 41 while the banknote storage cassette 4 is mounted in the drawer unit 31. When the banknote storage cassette 4 is removed from the drawer unit 31, the shutter 44 is controlled by the controller 28 to close and lock the receiving opening 41. Also, the shutter 44 keeps the receiving opening 41 closed and locked even after the banknote storage cassette 4 is removed from the drawer unit 31. FIG. 7 shows the state in which the receiving opening 41 is closed by the shutter 44. FIG. 8 shows the state in which the shutter 44 is opened to open the receiving opening 41.

[0056] The pickup opening 42 is for taking out banknotes from the banknote storage cassette 4 after the banknote storage cassette 4 is removed from the drawer unit 31. The openable door 43 hinged at the front surface of the banknote storage cassette 4 is provided with a lock 47 having a keyhole into which a key (not shown) is inserted. The openable door 43 is locked by this lock 47. The lock 47 is locked and unlocked at a cash processing center 66 described later.

[0057] The rear surface of the banknote storage cassette 4 has an engagement projection 45 which extends vertically. The engagement projection 45 is a portion to be engaged with the engagement recess 52 of the coin storage cassette 5, as shown in FIG. 17, and has a shape capable of being engaged with the engagement recess 52 (described in detail later).

[0058] Next, operation of the currency handling apparatus 1 at the time of a transfer process will be described with reference to FIGS. 3 and 4. To perform the transfer process, a "transfer" key of the operating section 25 is pressed first and authentication is done by inserting a magnetic card into the card reader 27.

[0059] Notes are placed in the banknote receiving opening 210, and coins are deposited in the coin receiving opening 220, and in this state, a "start" key of the operating section 25 is pressed. By this operation, in the banknote handling section 21, the banknotes are delivered one by one by the feeding mechanism of the banknote receiving unit 211 to be recognized by the banknote recognition unit 212 and counted. In the coin handling section 22, the coins are delivered one by one from the reservoir hopper unit 221 to be recognized by the coin recognition unit 222 and counted.

[0060] Among the banknotes having passed the banknote recognition unit 212, acceptable banknotes are transported to the banknote escrow unit 213, and unacceptable banknotes are transported to the banknote reject unit 214, according to the result of recognition by the banknote recognition unit 212. Similarly, among the coins having passes the coin recognition unit 222, acceptable coins are transported to the coin escrow unit 223, and unacceptable coins are transported to the coin reject unit 224, according to the result of recognition by the coin recognition unit 222.

[0061] When the counting of all the banknotes and coins located in the banknote receiving opening 210 and the coin receiving opening 220 is completed, the count result is displayed on the display 24. If the user presses an "enter" key of the operating section 25 after he/she checks the count result, the banknotes in the banknote escrow unit 213 are stored in the banknote storage cassette 4, and the coins in the coin escrow unit 223 are stored in the coin storage cassette 5. This is the completion of the transfer process. Data about the transfer process, such as the count result, is stored in the currency handling apparatus 1. The count data is transferred to a POS server 63 by the communication section 23 and printed on a journal 261 at the time of the collection of the cassettes 4 and 5, as described later.

[0062] On the other hand, if the user presses a "cancel"

key of the operating section 25 because, for example, the count result displayed on the display 24 is incorrect, the openable door of the banknote escrow unit 213 is unlocked so that the banknotes are returned to the user, and the coins in the coin escrow unit 223 are dropped in the return box 228 to be returned to the user. In this case, the returned banknotes and coins may be located in the banknote receiving opening 210 and the coin receiving opening 220 to perform the transfer process again.

[0063] In the case where banknotes and coins are returned to the banknote reject opening 218 and the coin reject opening 229 in the transfer process, the banknotes and coins are located again in the banknote receiving opening 210 and the coin receiving opening 220, followed by a press of the "start" key, thereby making it possible to perform the aforementioned process again. The banknotes etc. which are eventually returned are separately controlled as unfit banknotes. In general, the unfit banknotes are handed over to a person in charge from the CIT company who came to collect the cassettes 4 and 5, as described later.

[0064] Notes and coins are stored in the banknote storage cassette 4 and the coin storage cassette 5, respectively, by the handling section 2 of the currency handling apparatus 1 in the manner as described above.

(Structure of System for Receiving Sale Proceeds)

[0065] FIG. 5 shows an entire structure of the system 6, which includes the currency handling apparatus 1, for receiving sale proceeds. As mentioned earlier, the currency handling apparatus 1 is placed in retail stores. A POS (point of sales) system 61 is built in the retail stores or chain stores including retail stores. The POS system 61 includes first to n^{th} POS registers 621 to 62n, the POS server 63, and the wired or wireless communication line 64 connecting each of the POS registers 62 and the POS server 63. The currency handling apparatus 1 is connected to the communication line 64. Also, as an example of terminals other than the POS server 63, a cash consolidation terminal 65 is connected to the communication line 64.

[0066] As mentioned earlier, the currency handling apparatus 1 is configured to be able to handle a plurality of kinds of currencies. The POS system 61 including the currency handling apparatus 1 is also configured to be able to handle a plurality of kinds of currencies including the country's own currency and currencies of different countries. Here, as an example, the POS system 61 is configured to be able to handle both of US dollars as the country's own currency and Canadian dollars as a currency of a different country. That is, each of the POS registers 62 can accept both US dollars and Canadian dollars. Here, change is given in only US dollars.

[0067] Each POS register 62 has a function of transferring its sales data to the POS server 63 via the communication line 64. Here, the sales data transferred by each POS register 62 may be sales data converted to US dollars, or may be data in which sales in US dollars and sales in Canadian dollars are separate.

[0068] The sale proceeds collected from each POS register 62 are transferred to the currency handling apparatus 1, as described earlier. This transfer process is performed for each POS register 62. The currency handling apparatus 1 sends the count data for each POS register 62 to the POS server 63 via the communication line 64. Here, the data sent by the currency handling apparatus 1 is data in which count data in US dollars and count data in Canadian dollars are separate.

[0069] The POS server 63 has a function which determines a conversion rate between the US dollar and the Canadian dollar, and converts the currency unit of the count data sent from the currency handling apparatus 1 to the US dollar. If necessary, the POS server 63 converts the currency unit of the sales data sent from the POS registers 62 to the US dollar as well. The POS server 63 compares the sales data and the count data for each POS register 62, and calculates an amount of difference between the sales data and the count data in the US dollar. The comparison result may be displayed on the display of the POS server 63 in the manner, for example, as shown in FIG. 6. Although not shown in the drawing, the comparison results for the POS registers 62 may be displayed as a list, and may be displayed such that registers of which the amount of difference between the sales data and the count data exceeds an acceptable range determined in advance, and the registers of which the amount of difference is within the acceptable range, are distinctively shown. This makes it possible to calculate the amount of difference in a specific currency unit, and therefore possible to know a precise amount of difference in the POS system 61 capable of handling a plurality of kinds of currencies.

[0070] In this example, the POS server 63 compares the sales data and the count data. However, the structure is not limited to this structure. For example, the currency handling apparatus 1 may have a function which sets a conversion rate. In this case, the sales data of each POS register 62 may be transferred from the POS server 63 to the currency handling apparatus 1, and the sales data and the count data may be compared by the currency handling apparatus 1. Also, the sales data and the count data may be compared by another terminal, such as the cash consolidation terminal 65, which is connected to the communication line 64.

[0071] A transfer process is performed at the currency handling apparatus 1, and the banknote storage cassette 4 and the coin storage cassette 5 storing banknotes and coins, respectively, are collected by a CIT company as shown in FIG. 5, and transported to the cash processing center 66 of the CIT company.

[0072] Now, a collecting process at the currency handling apparatus 1 will be briefly described. First, a "collection" key of the operating section 25 is pressed and authentication is made by a magnetic card. As a result of this operation, a journal 261 relating to cash in the

banknote storage cassette 4 and the coin storage cassette 5 is printed by the printer 26. In addition, the drawer unit 31 of the cashbox section 3 is unlocked, so that the drawer unit 31 can be pulled out. Consequently, the banknote storage cassette 4 and the coin storage cassette 5 which are mounted in the drawer unit 31 can be removed from the drawer unit 31. An empty banknote storage cassette 4 and an empty coin storage cassette 5 are mounted in the mounting units 311 and 312, respectively. The drawer unit 31 is placed in the housing and locked to complete the collecting process at the currency handling apparatus 1. If there is an unfit banknote as described above, the unfit banknote is handed over to a person in charge from the CIT company.

[0073] The person in charge from the CIT company transports the cassettes 4 and 5, the printed journal and unfit banknotes, if any, to the cash processing center 66.

[0074] In the cash processing center 66, banknotes and coins are removed from the banknote storage cassette 4 and the coin storage cassette 5, and a counting process is performed again. Then, the result of counting and the count data of the journal 261 are compared. The cash is deposited in the retailer's account by the CIT company according to the result of comparison. Information about the deposited amount may be sent to the POS system 61 when the cash is deposited in the retailer's account.

[0075] The empty banknote storage cassette 4 and the empty coin storage cassette 5, from which banknotes and coins have been removed at the cash processing center 66, are transported and mounted in the currency handling apparatus 1 when the cassettes in the currency handling apparatus 1 are collected next time. The cassettes 4 and 5 collected from each retail store may be transported to the bank, not to the cash processing center 66.

(Cassette Structure Suitable For Distinguishing Between Checked and Unchecked Cassettes)

[0076] Here, many cassettes 4 and 5 collected from various places are gathered at the cash processing center 66. Thus, it is preferable if it is possible to distinguish whether the cassettes 4 and 5 are checked, i.e., currencies have been taken, or unchecked, i.e., currencies are not yet taken, in terms of work efficiency of a cash settlement performed at the cash processing center 66.

[0077] As shown in FIGS. 7-11, the banknote storage cassette 4 is provided with a display unit 9. The display unit 9 distinctively indicates whether the banknote storage cassette 4 is unchecked, i.e., currencies are not yet taken, or checked, i.e., currencies have been taken. The display unit 9 automatically changes its display information from unchecked to checked state, when a person in charge removes the currencies from the banknote storage cassette 4 at the cash processing center 66. Further, the display unit 9 automatically changes its display information from checked to unchecked state, after an empty banknote storage cassette 4 is mounted in the currency handling apparatus 1 until the banknote storage cassette 4 is collected from the currency handling apparatus 1. The change in display information from unchecked to checked state results from the movement of the stage 46 provided in the banknote storage cassette 4. On the other hand, the change in display information from checked to unchecked state results from the movement of the banknote storage cassette 4 when the banknote storage cassette 4 is mounted in the currency handling apparatus 1.

[0078] The stage 46 has a function of holding a stack of banknotes in the banknote storage cassette 4. The stage 46 is movable along a vertical direction in a reciprocating manner in the banknote storage cassette 4. The stage 46 includes a base 461, a mounting board 462 on which banknotes are placed, and a pantograph mechanism 463 provided between the base 461 and the mounting board 462. The basic structure of the stage 46 is known. Thus, the structure of the stage 46 will be briefly described.

[0079] Guides 464 are attached to both right and left end portions of the base 461, the guides 464 protruding outward. The guides 464 engage with guide rails 465 which are attached on the right and left side walls in the banknote storage cassette 4 and which extend vertically. Thus, the base 461 is guided along the guide rails 465 to move vertically in a reciprocating manner. Although not shown in the drawings, a belt of a pulley-belt mechanism which is provided in the banknote storage cassette 4 so as to extend vertically, is fixed to the base 461. The pulley-belt mechanism is controlled by the controller 28 of the currency handling apparatus 1 while the banknote storage cassette 4 is mounted in the currency handling apparatus 1. As a result of this drive control, the stage 46 moves along a vertical direction in a reciprocating manner in the banknote storage cassette 4, from the position above the receiving opening 41 (the uppermost position), illustrated in solid line in FIG. 8, to the position of the bottom face in the banknote storage cassette 4 (the lowermost position), illustrated in dashed line in the same drawing.

[0080] Further, while the banknote storage cassette 4 is removed from the currency handling apparatus 1, the pulley-belt mechanism is locked and the stage 46 cannot move along the vertical direction. The pulley-belt mechanism is unlocked by operating an unlock lever (not shown) provided in the banknote storage cassette 4, thereby making it possible to move the stage 46 manually along a vertical direction. The pulley-belt mechanism is unlocked to bring the stage 46 down to the lowermost position so that the banknotes can be taken from inside the banknote storage cassette 4 as described later.

[0081] One of characteristic features of the stage 46 according to this banknote storage cassette 4 is an engagement bar 466 which is fixed to the base 461 and which protrudes outward from the left side portion of the base 461. The engagement bar 466 is for engaging with

a display changing unit 92 as described later.

[0082] The mounting board 462 is a generally rectangular plate-like member whose top face is a mounding surface on which banknotes are mounted and whose size is the same as or larger than the size of a banknote.

[0083] The pantograph mechanism 463 includes two members which are pivotally connected to each other so as to form an X shape when viewed from the front. The mounting board 462 is supported by the pantograph mechanism 463 such that the relative movement of the mounting board 462 with respect to the base 461 along a vertical direction is possible. Further, the pantograph mechanism 463 includes a spring member (not shown). The mounting board 462 is biased by the spring force of the spring member in a direction away from the base 461, that is, upward.

[0084] Further, the banknote storage cassette 4 includes, as shown only in FIGS. 8 and 10, four claw portions 467 and 468, in total, which press the upper surface of the banknotes stacked on the mounting board 462. Two of the four claw portions 467 and 468 are provided so as to correspond to right and left side portions of the generally-rectangular mounting board 462. The other two claw portions are provided so as to correspond to rear side portions of the mounting board 462, with a predetermined space left therebetween in a lateral direction. The claw portions 467 and 468 are located above the receiving opening 41 while the banknote storage cassette 4 is mounted in the currency handling apparatus 1 to store banknotes. The claw portions 467 and 468 are accommodated in the banknote storage cassette 4 when the shutter 44 is closed, such as when the storage is finished and when the banknote storage cassette 4 is removed from the currency handling apparatus 1.

[0085] Each of the claw portions 467 and 468 extends from the locations outside the mounting board 462 toward a center of the mounting board 462, and the tip end portion of each of the claw portions 467 and 468 overlaps the mounting board 462 in plan view (see FIG. 10). The base end portion of each of the claw portions 467 and 468 is rotatably attached to and supported by a support member 469 which is provided so as to surround the rear side of the mounting board 462, and is biased to extend horizontally by an biasing force of biasing means (not shown). Thus, as indicated by arrows in FIG. 8, each of the claw portions 467 and 468 can be switched between the position at which the claw portion extends in a horizontal direction and the position at which the claw portion extends in a vertical direction after rotating downward from the horizontal position.

[0086] In the case where the banknote storage cassette 4 is mounted in the currency handling apparatus 1, a stack of banknotes are pushed out from the banknote escrow unit 213 downward to the mounting board 462 and mounted on the mounting board 462. Here, the claw portions 467 and 468 are pushed downward, and thereby rotate by the stack of banknotes moving downward, to allow the banknotes to pass through the claw portions 467 and 468. After the stack of banknotes pass through the claw portions 467 and 468, the claw portions 467 and 468 return to the horizontal position by the aforementioned biasing force. Since the mounting board 462 is biased upward by the pantograph mechanism 463 as described before, the stack of banknotes mounted on the mounting board 462 are sandwiched between the mounting board 462 and the claw portions 467 and 468 in a vertical direction.

[0087] The base 461 moves downward by appropriate control of the pulley-belt mechanism by the controller 28, according to the amount of banknotes mounted on the mounting board 462. The banknotes are successively stacked on the mounting board 462 in this manner.

[0088] The display unit 9 is configured to include a display window 91 formed in a lower portion of the left side surface of the banknote storage cassette 4, and a display changing unit 92 provided in the banknote storage cassette 4 so as to face the display window 91.

[0089] The display window 91 is made of a transparent material fitted in the left side wall of the banknote storage cassette 4, and has a strip-like shape extending in a vertical direction. The display window 91 may be made of a through hole formed in the left side wall of the banknote storage cassette 4 so as to pass through the thickness of the left side wall.

[0090] The display changing unit 92 is attached to the banknote storage cassette 4 such that the display changing unit 92 can rotate, in this case, only through 90 degrees on an axis extending in a vertical direction, both clockwise and counterclockwise. The display information of the display unit 9, the display information being shown to the outside through the display window 91, is changed by the rotation of the display changing unit 92.

[0091] As shown in FIG. 11, the display changing unit 92 includes: rotational bars 921 and 922 which protrude upward and downward from the upper end and the lower end of the display changing unit 92, respectively, and which are rotatably supported by bearings provided at the banknote storage cassette 4; a display surface 923 which is provided so as to extend between the two rotational bars 921 and 922 in a vertical direction; an inclined engagement portion 924 which is inclined with respect to the vertical direction and with which the engagement bar 466 of the banknote storage cassette 4 engages; and an engagement protrusion 925 with which an engagement plate 313 (described later) located in the mounting unit 311 of the currency handling apparatus 1 engages. The engagement plate 313 protrudes into the banknote storage cassette 4 through a through hole formed in the bottom wall of the banknote storage cassette 4, when the banknote storage cassette 4 is mounted in the mounting unit 311 of the drawer unit 31 (described in detail later).

[0092] As shown in FIGS. 9 and 10, one end of an extension spring 926 is attached to the display changing unit 92, and other end of the extension spring 926 is attached and fixed at a predetermined location of the ban-

knote storage cassette 4.

[0093] In the position as shown in the drawings on the left side of FIG. 13 and the drawings on the right side of FIG. 14, that is, the position in which the display surface 923 does not face the display window 91, the extension spring 926 is located on one of opposing sides with respect to the rotational bars 921 and 922 (at the side close to the left side wall of the banknote storage cassette 4). Thus, the display changing unit 92 is biased in a counterclockwise direction. This means that the position in which the display surface 923 does not face the display window 91 is maintained.

[0094] On the other hand, in the position as shown in the drawings on the right side of FIG. 13 and drawings on the left side of FIG. 14, that is, the position in which the display surface 923 faces the display window 91 after the rotation of the display changing unit 92 only through 90 degrees in a clockwise direction, the extension spring 926 is located on the other side of the opposing sides with respect to the rotational bars 921 and 922 (at the side farther from the left side wall of the banknote storage cassette 4). Thus, the display changing unit 92 is biased in a clockwise direction. This means that the position in which the display surface 923 faces the display window 91 is maintained.

[0095] As described above, the display unit 9 is switched between the state in which the display surface 923 faces the display window 91 and is visible from outside the banknote storage cassette 4 through the display window 91, and the state in which the display surface 923 does not face the display window 91 and is invisible from outside the banknote storage cassette 4 through the display window 91, by the rotation of the display changing unit 92. In other words, as described later, when the display surface 923 is invisible, the display information indicates unchecked state, and when the display surface 923 is visible, the display information indicates checked state.

[0096] Next, flows of collecting and checking the banknote storage cassette 4, and a switching movement of the display information of the display unit 9, the switching movement corresponding to the flows, will be described with reference to FIGS. 12-14.

[0097] First, when the drawer unit 31 of the currency handling apparatus 1 is pulled out to collect the banknote storage cassette 4, the shutter 44 of the banknote storage cassette 4 is closed to seal the receiving opening 41. A stack of banknotes 10 are thereby stored in the banknote storage cassette 4. Here, the display surface 923 of the display changing unit 92 does not face the display window 91, and thus, the display unit 9 indicates unchecked state. The banknote storage cassette 4 is transported to the cash processing center 66, with the display unit 9 maintained to indicate unchecked state (see P1 of FIG. 12).

[0098] To perform a cash settlement at the cash processing center 66, the lock 47 of the openable door 43 is unlocked with a key to open the openable door 43, and the stage 46 is brought down to the lowermost position by operating the unlock lever (not shown) as mentioned above. The stage 46 is fixed at its lowermost position by a lock mechanism (not shown). After that, the stack of banknotes held on the stage 46 is removed from the banknote storage cassette 4.

[0099] Here, when the stage 46 is brought down to the lowermost position, the engagement bar 466 attached to the base 461 of the stage 46 comes into contact with the inclined engagement portion 924 of the display changing unit 92, as shown in the drawings on the left side of FIG. 13. As the engagement bar 466 goes down more, the inclined engagement portion 924 is pushed in a horizontal direction, and the display changing unit 92 is rotated in a clockwise direction on the rotational bars 921 and 922 (see the arrows in the same drawing). As a result, the display changing unit 92 is in the position in which the display surface 923 faces the display window 91, as shown in the drawings on the right side of FIG. 13. That is, the display surface 923 is visible from the outside through the display window 91, and therefore the display unit 9 indicates checked state (see P2 of FIG. 12).

[0100] The display unit 9 continues to indicate checked state even after the openable door 43 is closed thereafter and the inside of the banknote storage cassette 4 is invisible. It is thus possible to know, from the outside, that the banknote storage cassette 4 has been checked. This means that the display information of the display unit 9 differs between the unchecked banknote storage cassette 4 illustrated as P1 in FIG. 12 and the checked banknote storage cassette 4 illustrated as P2 and P3 of FIG. 12. Therefore, the unchecked cassette and the checked cassette are prevented from being mistaken at the cash processing center 66. As a result, efficiency of the cash settlement can be improved.

[0101] The empty banknote storage cassette 4 which has been checked at the cash processing center 66 is transported to a retail store and mounted in the currency handling apparatus 1 again, as described earlier. The display unit 9 maintains the display information indicating the checked state at the time of transportation and mounting as well, as illustrated as P3 in FIG. 12. It is therefore possible to check again from the outside that the banknote storage cassette 4 is empty, immediately before the drawer unit 31 is pulled out to mount the banknote storage cassette 4 in the mounting unit 311. This can prevent the banknote storage cassette 4 which has banknotes inside to be mistakenly mounted in the currency handling apparatus 1.

[0102] The engagement plate 313 provided at the mounting unit 311 moves relatively upward with respect to the banknote storage cassette 4 as shown in the drawings on the left side of FIG. 14, when the banknote storage cassette 4 is inserted in the mounting unit 311 in a downward direction to mount the banknote storage cassette 4 in the currency handling apparatus 1. Thus, the engagement plate 313 projects into the banknote storage cassette 4 through the through hole 48 formed in the bottom wall of the banknote storage cassette 4. The en-

gagement plate 313 includes an inclined face which is inclined with respect to a vertical direction, and the inclined face engages with the engagement protrusion 925 of the display changing unit 92. This results in the display changing unit 92 rotating in a counterclockwise direction on the rotational bars 921 and 922 (see the arrows in the same drawing). As a result, the display changing unit 92 is in the position in which the display surface 923 does not face the display window 91, as shown in the drawings on the right side of the FIG. 14. That is, the display surface 923 is invisible through the display window 91, and therefore, the display unit 9 indicates unchecked state. After the mounting of the banknote storage cassette 4 in the currency handling apparatus 1, the shutter 44 of the banknote storage cassette 4 is opened by the controller 28 of the currency handling apparatus 1, and the stage 46 is moved to the uppermost position to be ready for receiving banknotes (see P4 of FIG. 12).

[0103] As mentioned earlier, the display unit 9 maintains the indication of unchecked state, until the banknote storage cassette 4 is removed from the currency handling apparatus 1, and the stage 46 is brought down to the lowermost position at the cash processing center 66.

[0104] As described above, whether the banknote storage cassette 4 is checked or unchecked is visually distinguishable. Therefore, the unchecked banknote storage cassette 4 and the checked banknote storage cassette 4 are prevented from being mistaken at the cash processing center 66. As a result, vain efforts such as trying to open the openable door 43 of the banknote storage cassette 4 and picking the banknotes therein can be prevented. Therefore, efficiency of the cash settlement can be improved.

[0105] Further, the banknote storage cassette 4 which has banknotes inside is prevented from being transported to a retail store etc. and mounted in a currency handling apparatus 1 at the retail store, with the banknotes inside the banknote storage cassette 4. Thus, it is possible to prevent cash discrepancies which result from such a mistake.

[0106] The banknote storage cassette 4 is configured such that the display information of the display unit 9 is changed from unchecked to checked state at a time of cash settlement when the stage 46 is brought down to the lowermost position, particularly in conjunction with the operation by a person in charge to remove banknotes from the banknote storage cassette 4. Further, the display information of the display unit 9 is changed from checked to unchecked state in conjunction with the movement of mounting the banknote storage cassette 4 in the currency handling apparatus 1. In other words, the display information of the display unit 9 is automatically changed. Thus, the display information of the display unit 9 accurately represents the state of the banknote storage cassette 4. As a result, efficiency of the above-described cash settlement can be improved and cash discrepancies can be prevented more reliably.

[0107] The engagement plate 313 may be attached to the mounting unit 311 such that the engagement plate 313 is movable along a vertical direction in a reciprocating manner, and the reciprocating movement of the engagement plate 313 may be controlled by the controller 28 of the currency handling apparatus 1. This enables the engagement plate 313 to project upward and engage with the engagement protrusion 925 of the display changing unit 92 at a desired time. In other words, the display information of the display unit 9 that indicates checked state can be changed into the display information that indicates unchecked state at an arbitrary time.

[0108] The structure of the display unit 9 is not limited to the structure shown in such as FIGS. 7 and 9. For example, the display unit 9 may have the structure shown in FIGS. 15 and 16.

[0109] According to this structure, the display window 93 formed in the banknote storage cassette 4 includes a plurality of slits 931 arranged in a vertical direction at predetermined equal spacings. The height of each slit 931 and the spacing between adjacent slits 931 are designed to be generally equal to each other.

[0110] On the other hand, the display changing unit 94 is attached to the banknote storage cassette 4 so as to slide along a vertical direction. Specifically, the display changing unit 94 has a strip-like shape, and is provided with guide grooves 941 and 942 which extend in a vertical direction at its both upper end portion and lower end portion. A guide pin 49 attached to a side wall of the banknote storage cassette 4 is inserted in each of the guide grooves 941 and 942. With this structure, the display changing unit 94 can slide up to a relatively upper position and down to a relatively lower position, along a vertical direction.

[0111] The display changing unit 94 includes, at its middle portion along a vertical direction, a display surface 943 which faces the display window 91. In this example, colored portions 944 and colorless portions 945 are alternately provided in stripes at the display surface 943.

[0112] A right side portion of the display changing unit 94 is provided with a holding mechanism 95 for positioning the display changing unit 94 at the upper position (see the drawing on the left side of FIG. 16) and the lower position (see the drawing on the right side of FIG. 16). The holding mechanism 95 includes a holding recess unit 953 which is provided on the banknote storage cassette 4 and in which two recesses 951 and 952 are formed next to each other along a vertical direction, and a plate spring 954 attached to the display changing unit 94. The plate spring 954 has a projecting portion which engages with each of the two recesses 951 and 952 of the holding recess unit 953. The position of the projecting portion is switched between the position in which the projecting portion engages with the recesses 951 and 952, and the position in which the projecting portion is out of the recesses 951 and 952, by the elastic force of the plate spring 954 as illustrated in solid line and phantom line in FIG. 16. The display changing unit 94 is located at the upper position and the lower position by the projecting

portion engaging with each of the two recesses 951 and 952 of the holding recess unit 953. Conversely, the holding recess unit 953, i.e., the two recesses, may be formed in the side portion of the display changing unit 94, and the projecting portion which engages with the recesses may be attached to the banknote storage cassette 4.

[0113] An outwardly extending protrusion 946 is integrally formed at a left side portion of the display changing unit 94. The protrusion 946 is a portion with which the engagement bar 466 attached to the stage 46 engages when the stage 46 is brought down to the lowermost position. That is, the engagement bar 466 which is brought down and engages with the protrusion 946, causes the display changing unit 94 located at the upper position to slide down to the lower position, with an elastic deformation of the plate spring 954. Further, the protrusion 946 is also a portion with which the engagement plate 313 provided on the currency handling apparatus 1 engages. That is, the engagement plate 313 which moves relatively upward with respect to the banknote storage cassette 4 and engages with the protrusion 946, causes the display changing unit 94 located at the lower position to slide up to the upper position, with an elastic deformation of the plate spring 954.

[0114] When the display changing unit 94 is located at the upper position, the colored portions 944 of the stripe pattern on the display surface 943 face the slits 931 of the display window 93. Thus, the colored portions 944 are visible from the outside through the slits 931. The display unit 9 therefore indicates unchecked state (see the drawing on the left side of FIG. 16). On the other hand, when the display changing unit 94 is located at the lower position, the colorless portions 945 of the stripe pattern on the display surface 943 face the slits 931 of the display window 93. Thus, the colorless portions 945 are visible from the outside through the slits 931. The display unit 9 therefore indicates checked state (see the drawing on the right side of FIG. 16).

[0115] The display information of the display unit 9 having this structure is automatically changed from unchecked to checked state in conjunction with the movement of the stage 46 brought down to the lowermost position. Further, the display information of the display unit 9 is automatically changed from checked to unchecked state in conjunction with the movement of mounting the banknote storage cassette 4 in the currency handling apparatus 1. As a result, an unchecked banknote storage cassette 4 and a checked banknote storage cassette 4 are reliably prevented from being mistaken.

[0116] The mechanism for changing the display information of the display unit 9 from unchecked to checked state is not limited to the mechanism which operates in conjunction with the movement of the stage 46. Any mechanism may be used as long as the mechanism operates in conjunction with the movement of a portion which a person in charge moves when he/she removes banknotes from the banknote storage cassette 4.

[0117] For example, the display information may be changed from unchecked to checked state in conjunction with the movement of unlocking the lock 47 of the openable door 43 of the banknote storage cassette 4, the movement of opening of the openable door 43, the operation of the unlock lever, the movement of closing the openable door 43, or the movement of locking the lock 47 of the openable door 43, or a combination of these movements.

[0118] Further, the mechanism for changing the display information of the display unit 9 from checked to unchecked state is not limited to the mechanism which operates in conjunction with the movement of placing the banknote storage cassette 4 in the currency handling apparatus 1. For example, the display information may be changed from checked to unchecked state in conjunction with the movement of the stage 46 moving upward after the banknote storage cassette 4 is mounted in the currency handling apparatus 1, and the movement of banknotes thrown into the banknote storage cassette 4.

[0119] Further, the change in display information of the display unit 9 does not have to be mechanically linked, but may be, for example, electrically or magnetically linked with various mechanisms. If the display information is electrically or magnetically linked with the various mechanisms, it becomes easy to change the display information of the display unit 9 at an arbitrary time, in particular to change the display information while the banknote storage cassette 4 is mounted in the mounting unit 311.

[0120] Further, the display information of the display unit 9 does not have to be changed in conjunction with various mechanisms. For example, the display information of the display unit 9 may be manually changed. However, in the case of manually changing the display information, the changing operation may be forgotten or done incorrectly. Therefore, the structure in which the display information is automatically changed is preferable in terms of accuracy of the display information.

[0121] Further, the coin storage cassette 5 may be provided with a display unit which distinctively indicates, so as to be visible from the outside, whether the coin storage cassette 5 is checked or unchecked.

[0122] Moreover, the display unit 9 does not only distinctively indicate whether a cassette is checked or unchecked. The display information of the display unit may include various information. For example, the display unit may indicate whether a banknote is stored in the cassette or not, or may indicate kinds (e.g., denominations or currency units) of the banknotes stored in the cassette. For example, in the case where the currency handling apparatus 1 is configured such that banknotes of different denominations are stored in different cassettes, the display information of the display unit of each cassette may be changed according to the denomination stored in the cassette. In that case, the display information of the display unit may be automatically changed according to the location in the currency handling apparatus 1 at which the cassette is mounted.

[0123] The display mode of the display unit can be changed not only by switching between display/undisplay modes and changing colors, but also by changing letters and signs, by switching between lightening, blinking, and shutting off of a lamp, and by changing the frequency of the blinking, for example.

[0124] Further, the display unit 9 does not only switch between two display modes, but also may switch between three or more display modes according to the types of information the display unit 9 indicates.

(Cassette Structure Suitable For Easy Handling During Transportation etc.)

[0125] As described above, the banknote storage cassette 4 is provided with the engagement projection 45, and the coin storage cassette 5 is provided with the engagement recess 52. This structure enables the banknote storage cassette 4 and the coin storage cassette 5 to be engaged and aligned with each other, as shown in FIG. 17, in a vehicle transporting the cassettes 4 and 5 or at the cash processing center 66. This is effective in avoiding load shifting.

[0126] Further, the engagement projection and the engagement recess do not have to be configured to connect the banknote storage cassette 4 and the coin storage cassette 5 in pairs. If, for example, the currency handling apparatus 1 is configured to include a plurality of banknote storage cassettes 4, the engagement projection and the engagement recess may be configured to connect the plurality of banknote storage cassettes 4 with one another, although not shown in the drawing. Similarly, if the currency handling apparatus 1 is configured to include a plurality of coin storage cassettes 5, the engagement projection and the engagement recess may be configured to connect the plurality of coin storage cassettes 5 with one another.

[0127] The collecting process performed by a CIT company includes visiting retail stores by a transportation car and collecting the banknote storage cassette 4 and the coin storage cassette 5 from each retail stores. This means that there are a plurality of banknote storage cassettes 4 and a plurality of coin storage cassettes 5 in the transportation car. Thus, as shown for example in FIG. 18, the banknote storage cassettes 4 may be engaged with one another, and the coin storage cassettes 5 may be engaged with one another. In this case, the shapes of the engagement projection and the engagement recess formed in each banknote storage cassette 4 and the shapes of the engagement projection and the engagement recess formed in each coin storage cassette 5 may be different from each other.

[0128] The cassettes do not have to be engaged with one another so as to align in a horizontal direction, but may be engaged with one another so as to be stacked in a vertical direction. That is, parts of the cassettes 4 and 5 at which the engagement projection and the engagement recess are formed are not specifically limited.

(Cassette Structure Effective In Increasing Efficiency In Handling Unfit Notes)

[0129] As described above, the unfit banknotes rejected by the currency handling apparatus 1 are separately controlled and handed over to a person in charge from the CIT company at the time of collection of the cassettes 4 and 5. Thus, a person at the retail store has to meet the person from the CIT company. This is bothersome and inefficient.

[0130] Therefore, the cassette may be divided into a fit banknote storage section for storing fit banknotes and an unfit banknote storage section for storing unfit banknotes, thereby making it possible to collect both of the fit banknotes and unfit banknotes by collecting a single cassette. As a result, the person at the retail store does not have to meet the from the CIT company at the time of collection of a cassette.

[0131] The banknote storage cassette 7 shown in FIGS. 19-21 is provided with a partition plate 71 within its interior. The partition plate 71 divides the cassette interior into two spaces, i.e., upper and lower spaces. In this banknote storage cassette 7, the upper space is a fit banknote storage section 72, and the lower space is an unfit banknote storage section 73. For convenience of understanding, a handle is not shown in FIG. 20.

[0132] A receiving opening 74 is formed in the top surface of the banknote storage cassette 7. As mentioned above, fit banknotes are dropped in the fit banknote storage section 72 through the receiving opening 74. The aforementioned stage 46 is provided in the fit banknote storage section 72. The stage 46 is configured to be movable along a vertical direction in a reciprocating manner in the fit banknote storage section 72. Further, the display window 91 of the display unit 9 is formed in the left side wall of the banknote storage cassette 7.

[0133] The rear surface of the banknote storage cassette 7 is provided with a pickup opening 77 which extends across the fit banknote storage section 72 and the unfit banknote storage section 73. The pickup opening 77 can be opened and closed by an openable door 78 hinged at the rear surface of the banknote storage cassette 7.

[0134] A slit 75 for receiving an unfit banknote into the unfit banknote storage section 73 is formed in a lower portion of the front surface of the banknote storage cassette 7. It is preferable that the slit 75 has a width which allows banknotes to pass through and a height which does not allow a finger of a person to pass therein.

[0135] As shown in FIG. 21, a pair of rollers 76 are provided in the interior of the banknote storage cassette 7. The pair of rollers 76 is positioned right behind the slit 75. The pair of rollers 76 vertically sandwiches the unfit banknote passing through the slit 75, and rotates to take the unfit banknote into the unfit banknote storage section 73. The pair of rollers 76 is controlled by the controller 28 of the currency handling apparatus 1.

[0136] As schematically shown in FIG. 21, an opening

315 for receiving unfit banknotes is formed in the front panel 314 of the drawer unit 31. A transportation mechanism 316 including a pair of rollers is provided so as to connect the opening 315 and the slit 75 of the cassette 7. The transportation mechanism 316 is controlled such that it transfers the unfit banknote received from the opening 315 to the slit 75, and feed the unfit banknote into the unfit banknote storage section 73 of the banknote storage cassette 7.

[0137] As shown in FIG. 21, the receiving opening 74 of the banknote storage cassette 7, the receiving opening 74 communicating with the fit banknote storage section 72, is formed in the top surface of the banknote storage cassette 7. Thus, as described earlier, the fit banknotes held in the banknote escrow unit 213 are stored in the fit banknote storage section 72 through the receiving opening 74.

[0138] On the other hand, the unfit banknotes discharged into the banknote reject opening 218 are deposited in the opening 315 formed in the front panel 314, and thereby stored in the unfit banknote storage section 73 through the transportation mechanism 316 and the pair of rollers 76. Data, specifically the denominations and the number of the unfit banknotes stored in the unfit banknote storage section 73, is input through a predetermined operation using the operating section 25 of the currency handling apparatus 1, in the case where the unfit banknotes are deposited in the opening 315. The currency handling apparatus 1 stores the count data of the fit banknotes and the data about the unfit banknotes.

[0139] The currency handling apparatus 1 prints the count data of the fit banknotes and the data about the unfit banknotes on the journal 261 by using the printer 26, at the time of collection of the banknote storage cassette 7. The journal 261 may be thrown into the unfit banknote storage section 73 through the slit 75.

[0140] Thus, it is possible to collect both of fit banknotes and unfit banknotes by collecting the single cassette 7. In addition, at the cash processing center 66, it is possible to remove all of the fit banknotes stored in the fit banknote storage section 72, the unfit banknotes stored in the unfit banknote storage section 73, and the journal 261 if any, by simply opening one openable door 78. This can advantageously improve efficiency of the cash settlement.

[0141] The mechanism for transferring unfit banknotes into the unfit banknote storage section 73 does not have to be the transportation mechanism 316, but may be, for example, a simple transport path 79 as shown in FIG. 22. The transport path 79 connects between the opening 315 formed in the front panel 314 of the drawer unit 31 and the slit 75 of the cassette 7 with each other. It is preferable that one end of the transport path 79 is inserted in the slit 75 to achieve smooth transfer of the unfit banknotes. If this structure is utilized, the one end of the transport path 79 has to be pulled back from the slit 75 when the cassette 7 is pulled up and removed from the mounting unit 311. Thus, it is preferable to provide a mechanism by which the one end of the transport path 79 is pulled back from the slit 75 when, for example, the drawer unit 31 is pulled up.

[0142] In this structure, it is preferable that instead of a pair of rollers, a shutter 710 is provided in the banknote storage cassette 7, for opening/closing the slit 75.

[0143] An advantage of the structure shown in FIG. 22 is that the structure of the transport path 79 can be simplified. However, the opening 315 for receiving unfit banknotes has to be located at approximately the same height as the height of the slit 75 of the cassette 7, which means that the opening 315 is located at a relatively low height. Thus, it is difficult to deposit the unfit banknotes.

[0144] On the other hand, an advantage of the structure shown in FIG. 21 is that it is possible to decide the location of the opening 315 relatively freely. That is, it is possible to place the opening 315 at a relatively high location so that the unfit banknotes can be deposited easily.

(Another Structure of Currency Handling Device)

[0145] The structure of the currency handling apparatus, particularly the structure of the banknote handling section is not limited to the structure shown in FIG. 3. For example, as shown in FIG. 23, the currency handling apparatus may include a plurality of tape-type stackers 81 in the cashbox section 3, instead of having the banknote escrow unit 213.

[0146] A detailed description of the tape-type stackers 81 is omitted because the structure of the tape-type stackers 81 is known. Each of the tape-type stackers 81 includes a rotating drum 811 which takes up banknotes transferred thereto, with the banknotes sandwiched between two tapes. This tape-type stacker 81 can receive and dispense a plurality of banknotes without changing the order of the banknotes.

[0147] A currency handling apparatus 8 having the above structure includes: a transport path for connecting the banknote recognition unit 212 with a dispensing unit 82 (the dispensing unit 82 functions as both the banknote reject unit 214 and a return opening as shown in FIG. 2); a transport path for connecting the banknote recognition unit 212 with each of the tape-type stackers 81; a transport path for connecting each tape-type stacker 81 with the dispensing unit 82; and a transport path for connecting each tape-type stacker 81 with the banknote storage cassette 4. Part of these transport paths is shared with each other.

[0148] An advantage of the currency handling apparatus 8 having the above structure is that the tape-type stackers 81 can function as a banknote escrow unit. Specifically, banknotes after recognition can be temporarily held in the tape-type stackers 81, and transported from the tape-type stackers 81 to the dispensing unit 82 according to the operation of the operating section 25, thereby making it possible to return the banknotes to the user. Further, the banknotes can be stored in the ban-

knote storage cassette 4, that is, can be received in the banknote storage cassette 4 by transporting the banknotes from the tape-type stackers 81 to the banknote storage cassette 4.

[0149] In addition, since the tape-type stackers 81 are provided in the cashbox section 3, banknotes can be stored in the tape-type stackers 81 when the banknote storage cassette 4 is filled up with banknotes. This is equivalent to increasing the capacity of the cashbox section 3. Thus, it is possible to reduce frequency in the cassette collection.

[0150] Further, it is possible to dispense a desired denomination, such as for the purpose of change, by using the plurality of tape-type stackers 81 as banknote escrow units for different denominations. That is, the currency handling apparatus 8 can function as a depositing/dispensing machine.

[0151] The currency handling apparatus is not limited to a depositing machine or a depositing/dispensing machine. The currency handling apparatus may be anything as long as it is a currency handling apparatus in which a detachable cassette is mounted.

INDUSTRIAL APPLICABILITY

[0152] As described above, the present invention is useful as a currency storage cassette and a currency handling apparatus having the currency storage cassette.

Claims

1. A currency storage cassette for storing a currency, comprising:

   a main body which has a receiving opening and a pickup opening and in which a currency deposited through the receiving opening is stored; and
   a display unit which is attached to the main body and which displays a display mode that is switched among a plurality of display modes including at least first and second display modes and that is visible from the outside, wherein
   the display mode is automatically switched to another display mode according to a state of the main body.

2. The currency storage cassette of claim 1, wherein
   the main body is detachably mounted in a mounting unit of the currency handling apparatus, and a currency is deposited in the main body through the receiving opening while the main body is mounted in the mounting unit, and
   the display mode of the display unit is switched from the first display mode to the second display mode after the main body is mounted in the mounting unit until the main body is removed from the mounting unit.

3. The currency storage cassette of claim 2, wherein
   the display mode of the display unit is switched from the first display mode to the second display mode in conjunction with a movement of the main body being mounted into the mounting unit.

4. The currency storage cassette of claim 2, wherein
   the display mode of the display unit is switched from the first display mode to the second display mode by control from the currency handling apparatus while the main body is mounted in the mounting unit.

5. The currency storage cassette of claim 1, wherein
   the main body is detachably mounted in a mounting unit of the currency handling apparatus, and a currency is deposited in the main body through the receiving opening while the main body is mounted in the mounting unit, and
   the display mode of the display unit is switched from the second display mode to the first display mode when the currency in the main body is removed through the pickup opening after the main body is removed from the mounting unit.

6. The currency storage cassette of claim 5, further comprising:

   a handling mechanism unit which is located in the main body and which is manually moved for removal of the currency stored in the main body through the pickup opening, wherein
   the display mode of the display unit is switched from the second display mode to the first display mode in conjunction with the movement of the handling mechanism unit.

7. The currency storage cassette of claim 6, wherein
   the display unit is mechanically linked with the movement of the handling mechanism unit, thereby switching the display mode of the display unit from the second display mode to the first display mode.

8. The currency storage cassette of claim 7, wherein
   the main body stores a banknote,
   the handling mechanism unit is a stage which is movable, in the main body, in a reciprocating manner in a direction along which banknotes are deposited through the receiving opening, and which holds a stack of the banknotes,
   the stage is manually moved to a predetermined pickup position which is away from the receiving opening to remove the banknotes held on the stage, and
   the display unit engages with the stage when the stage is moved to the pickup position, thereby

switching the display mode of the display unit from the second display mode to the first display mode.

9. The currency storage cassette of claim 1, wherein the first display mode indicates a checked state in which no currency is stored in the main body as a result of removal of the currency through the pickup opening, and
the second display mode indicates an unchecked state in which a currency is stored in the main body.

10. The currency storage cassette of claim 1, wherein the first display mode indicates that no currency is stored in the main body, and the second display mode indicates that a currency is stored in the main body.

11. A currency handling apparatus for handling a currency, comprising:

a currency storage cassette which has a receiving opening and a pickup opening and in which a currency is stored;
a mounting unit in which the currency storage cassette is detachably mounted;
a handling section for depositing a currency in the currency storage cassette mounted in the mounting unit through the receiving opening;
a display unit which is attached to the currency storage cassette and which displays a display mode that is switched among a plurality of display modes including at least first and second display modes and that is visible from the outside; and
a switching unit for switching the display mode of the display unit according to a state of the currency storage cassette.

FIG.1

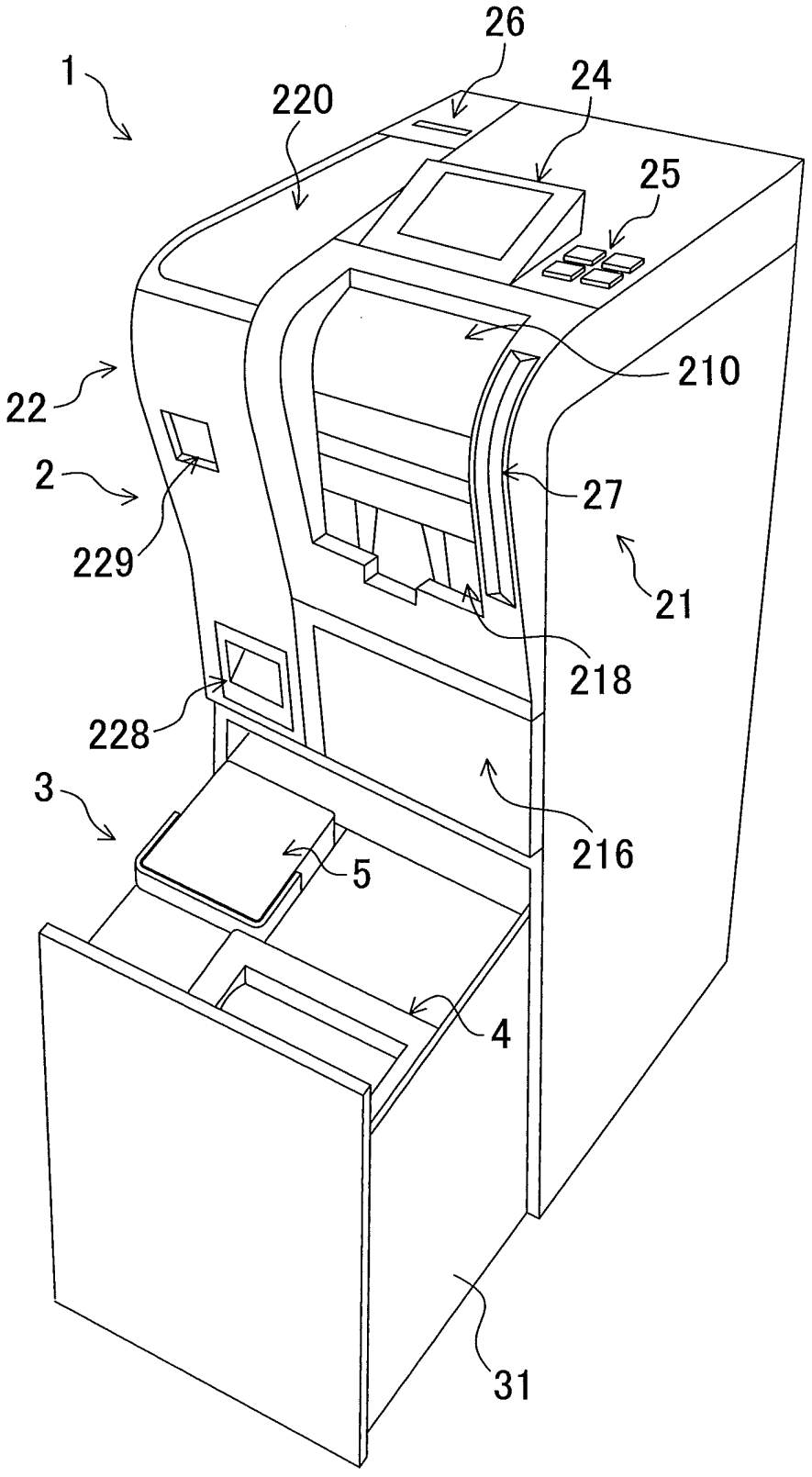


FIG.2

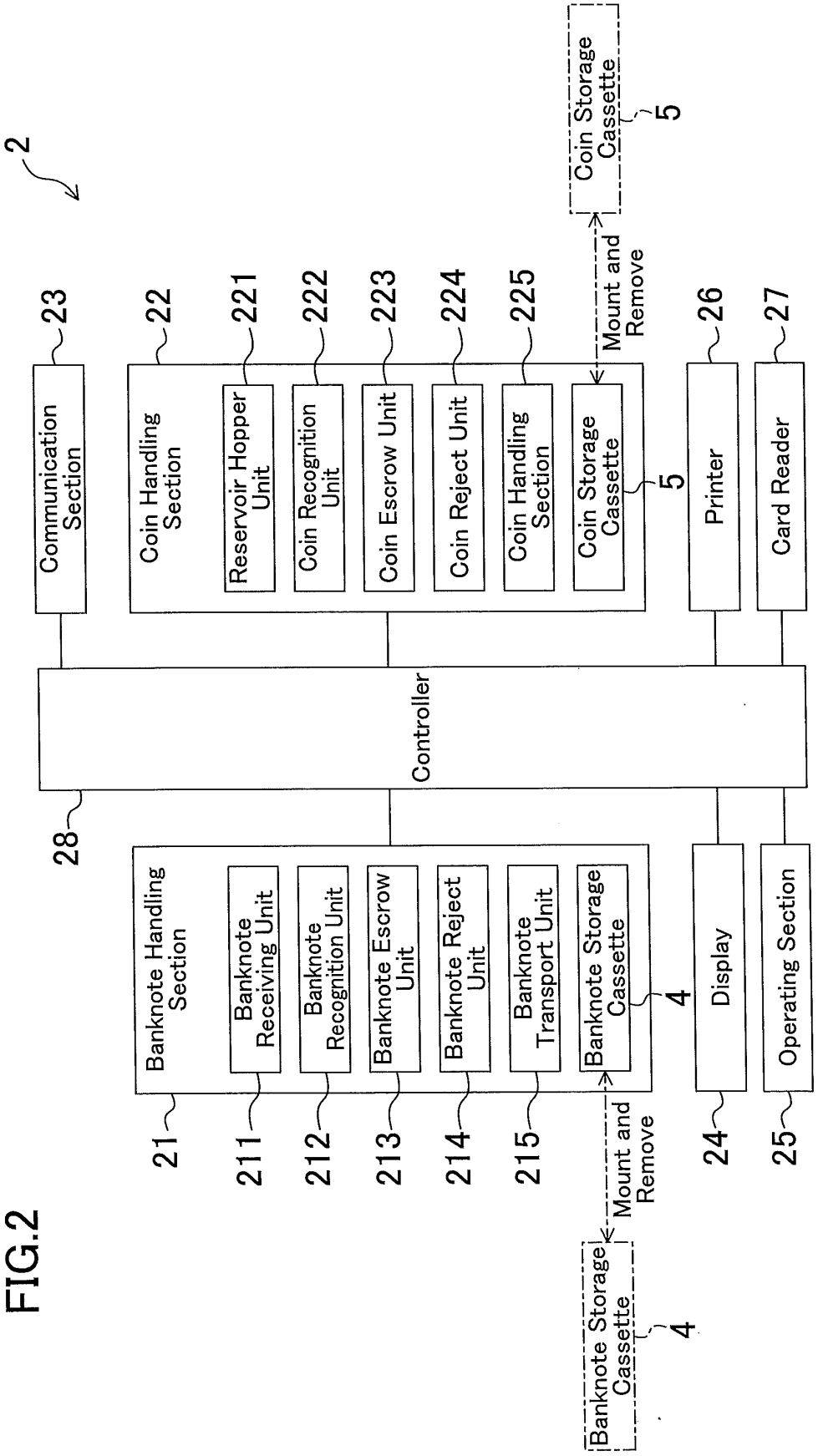

2
Communication Section
23
Coin Handling Section
22
Reservoir Hopper Unit
221
Coin Recognition Unit
222
Coin Escrow Unit
223
Coin Reject Unit
224
Coin Handling Section
225
Coin Storage Cassette
5
Coin Storage Cassette
5
Mount and Remove
Printer
26
Card Reader
27
Controller
28
Banknote Handling Section
21
Banknote Receiving Unit
211
Banknote Recognition Unit
212
Banknote Escrow Unit
213
Banknote Reject Unit
214
Banknote Transport Unit
215
Banknote Storage Cassette
4
Mount and Remove
Banknote Storage Cassette
4
Display
24
Operating Section
25

FIG.3

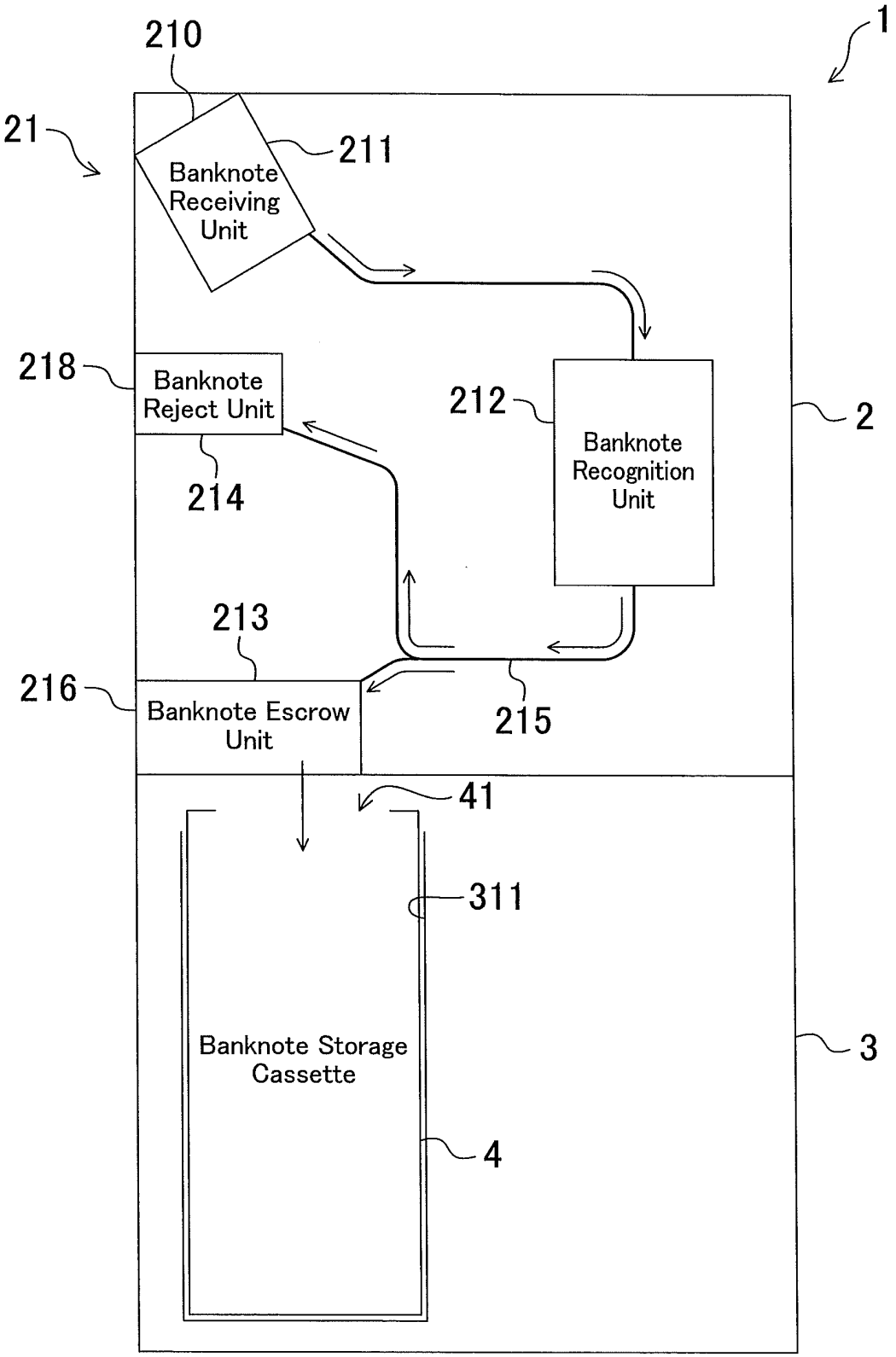

210
1
21
211
Banknote Receiving Unit
218
Banknote Reject Unit
212
Banknote Recognition Unit
2
214
213
216
Banknote Escrow Unit
215
41
311
Banknote Storage Cassette
3
4

FIG.4

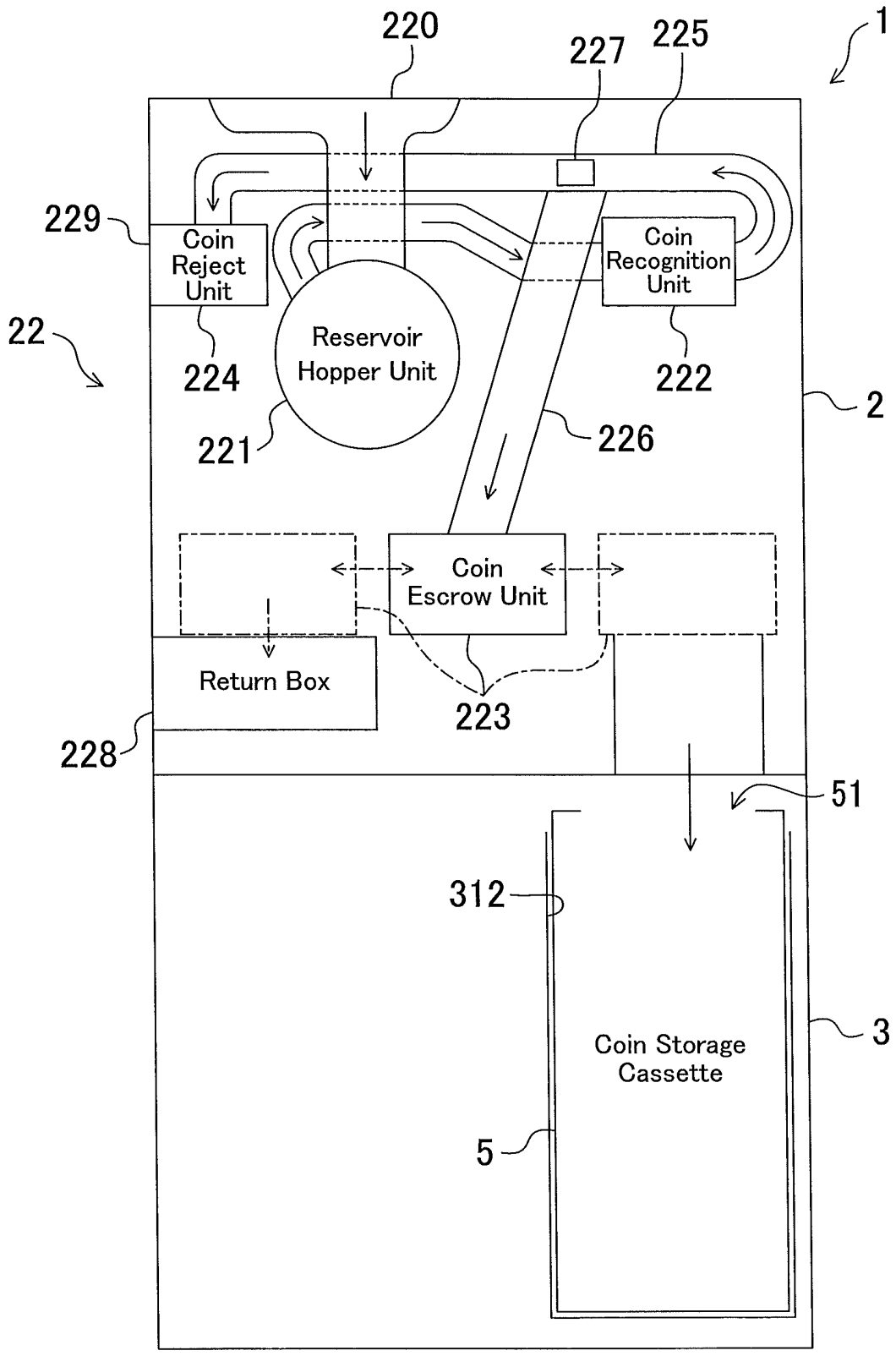

220
227
225
1
229
Coin Reject Unit
Coin Recognition Unit
22
Reservoir Hopper Unit
224
222
221
226
2
Coin Escrow Unit
Return Box
223
228
51
312
Coin Storage Cassette
3
5

FIG.5

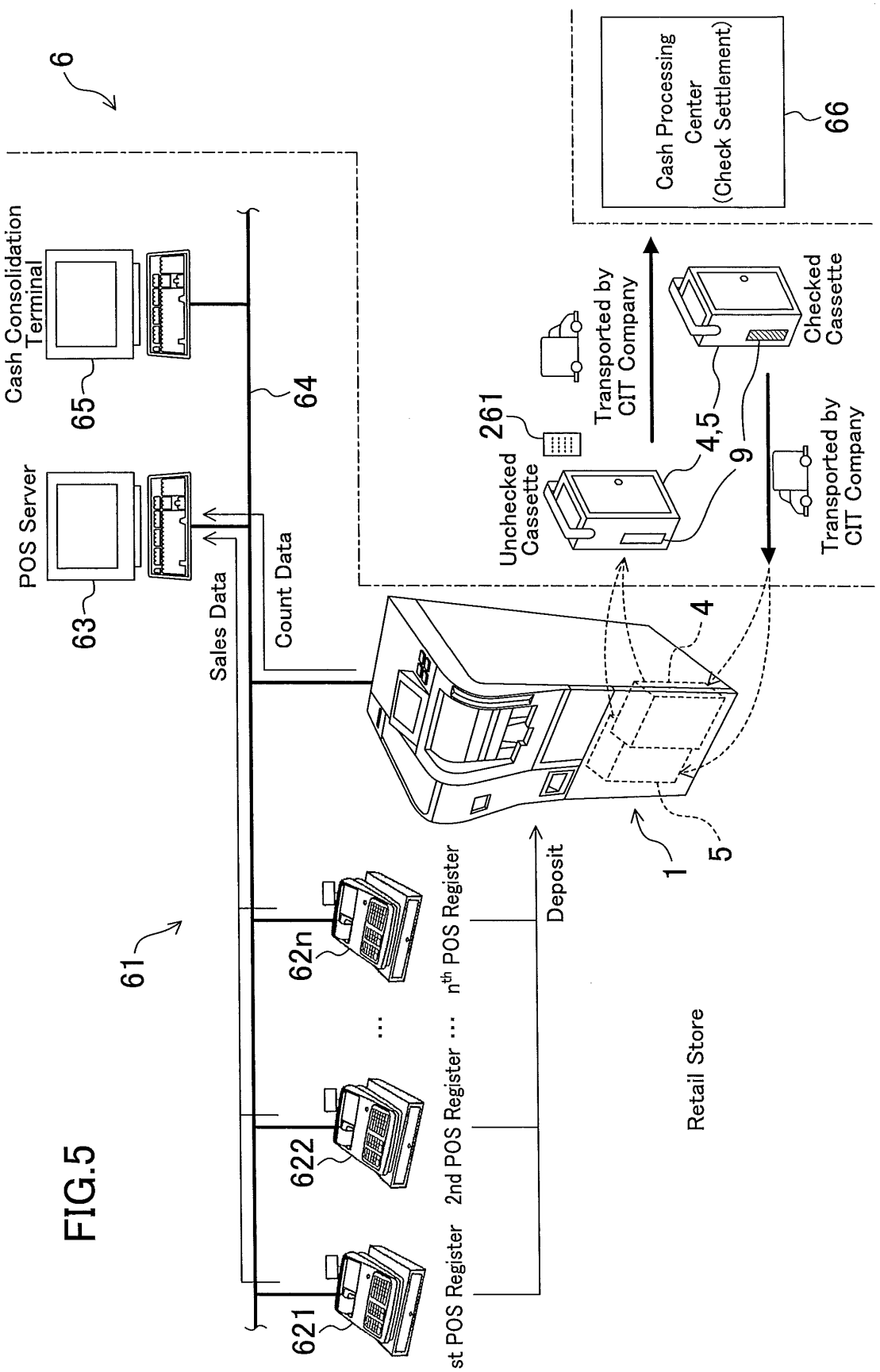

6
Cash Processing Center (Check Settlement)
66
Cash Consolidation Terminal
65
64
POS Server
63
Sales Data
Count Data
261
Unchecked Cassette
Transported by CIT Company
4,5
9
Checked Cassette
Transported by CIT Company
4
1
5
61
62n
622
621
nth POS Register
2nd POS Register
1st POS Register
Deposit
Retail Store

FIG.6

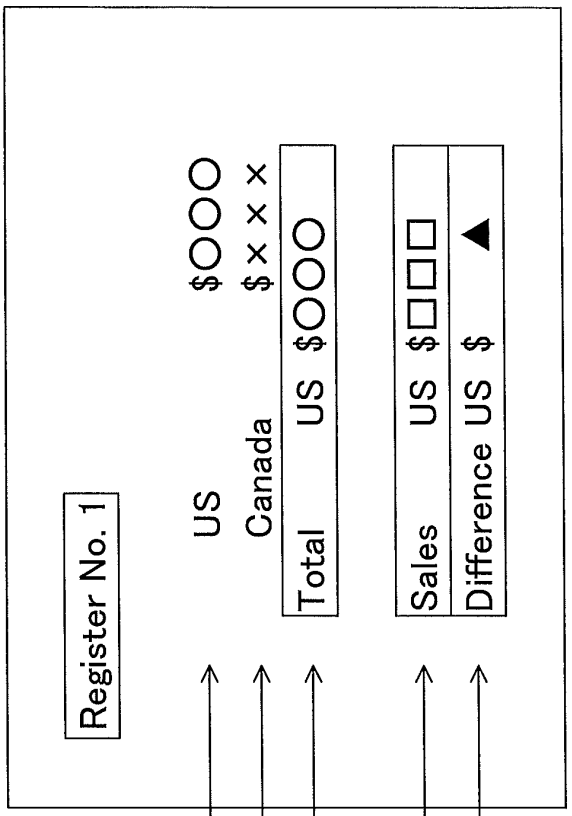

Register No. 1
US
$OOO
Canada
$×××
Total
US $OOO
Sales
US $□□□
Difference US $ ◀
Count Result of 1st Country's Currency
Count Result of 2nd Country's Currency
Count Result After Conversion To 1st Country's Currency
Sale Proceeds in 1st Country's Currency According to POS System
Difference in 1st Country's Currency (Sales−Total)

FIG.7

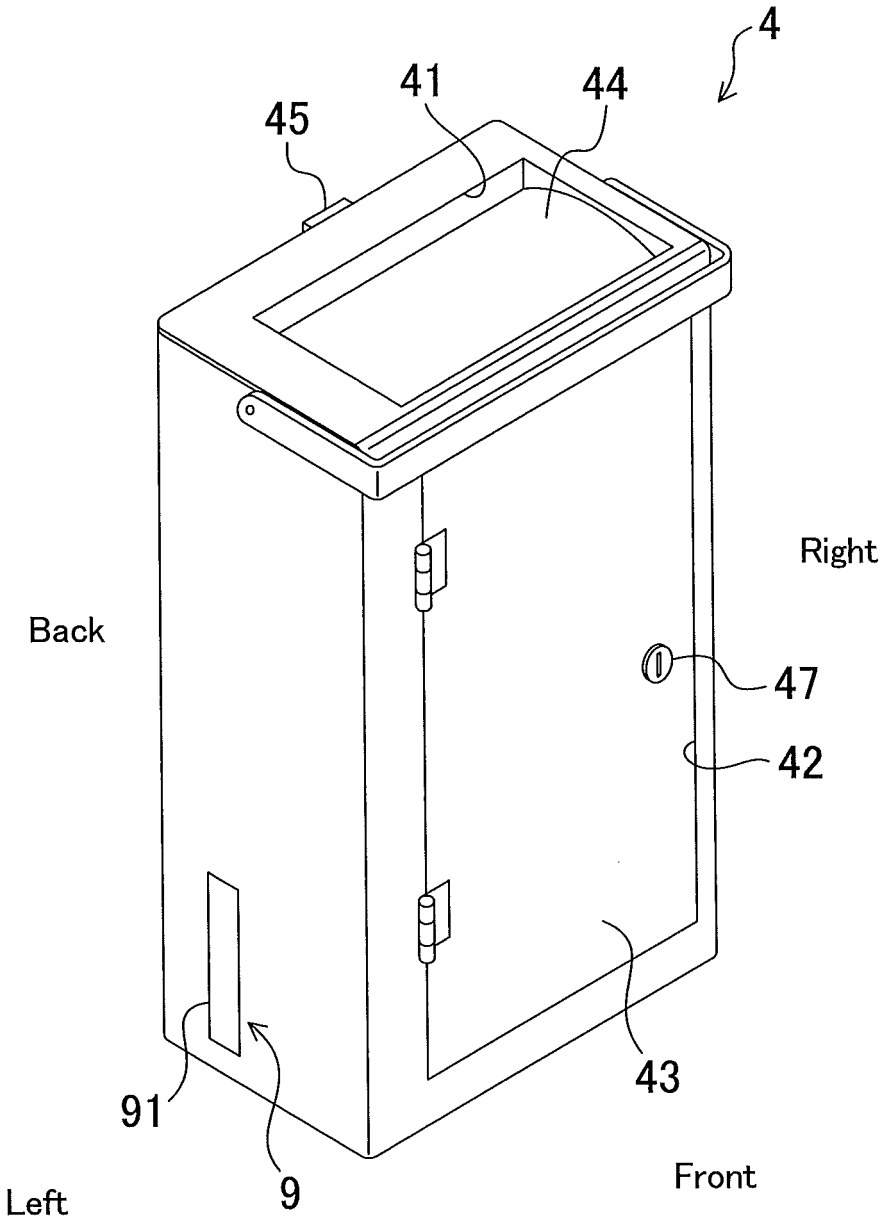


FIG.8

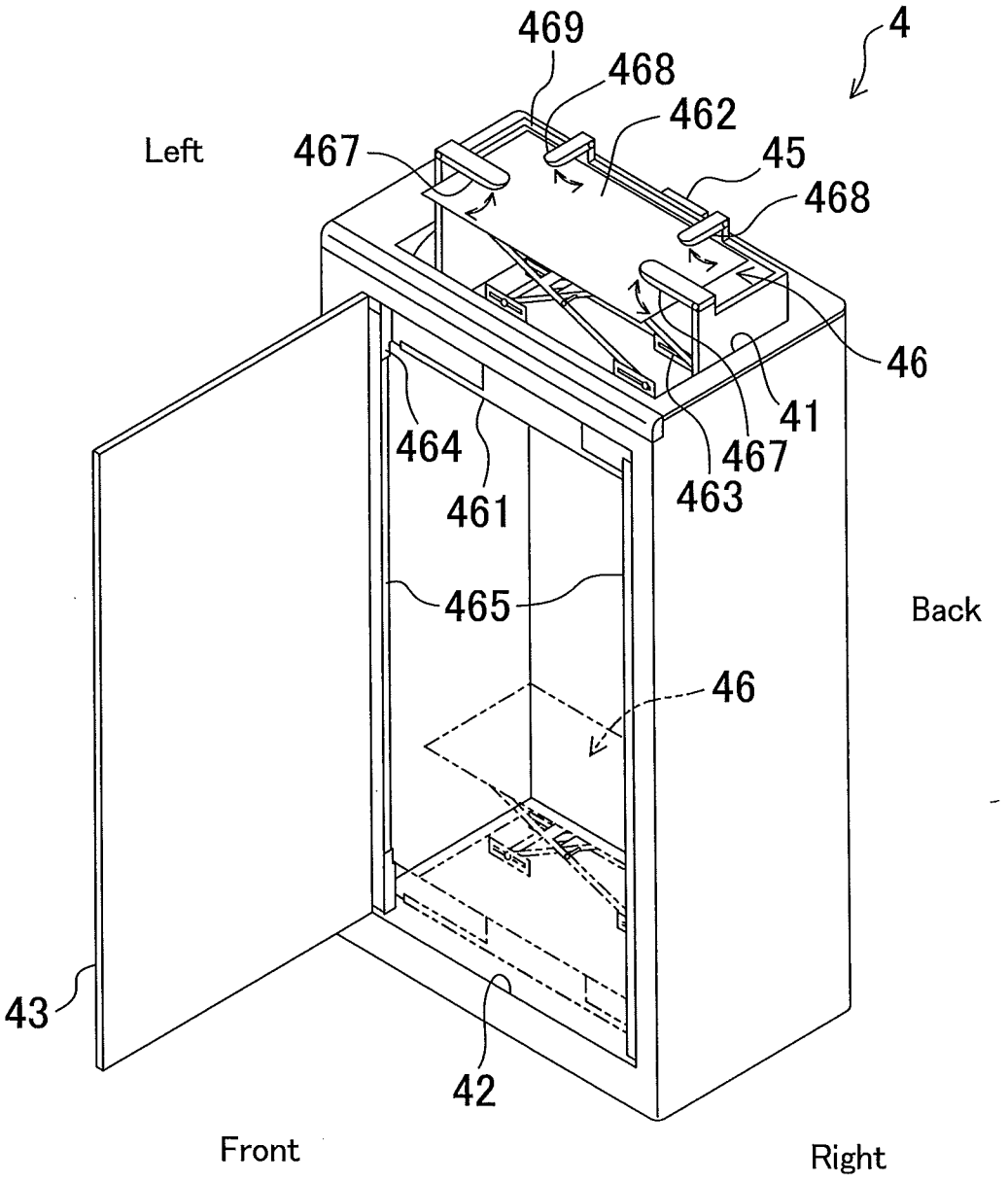

469
468
462
4
Left
467
45
468
46
41
464
467
461
463
465
Back
46
43
42
Front
Right

FIG.9

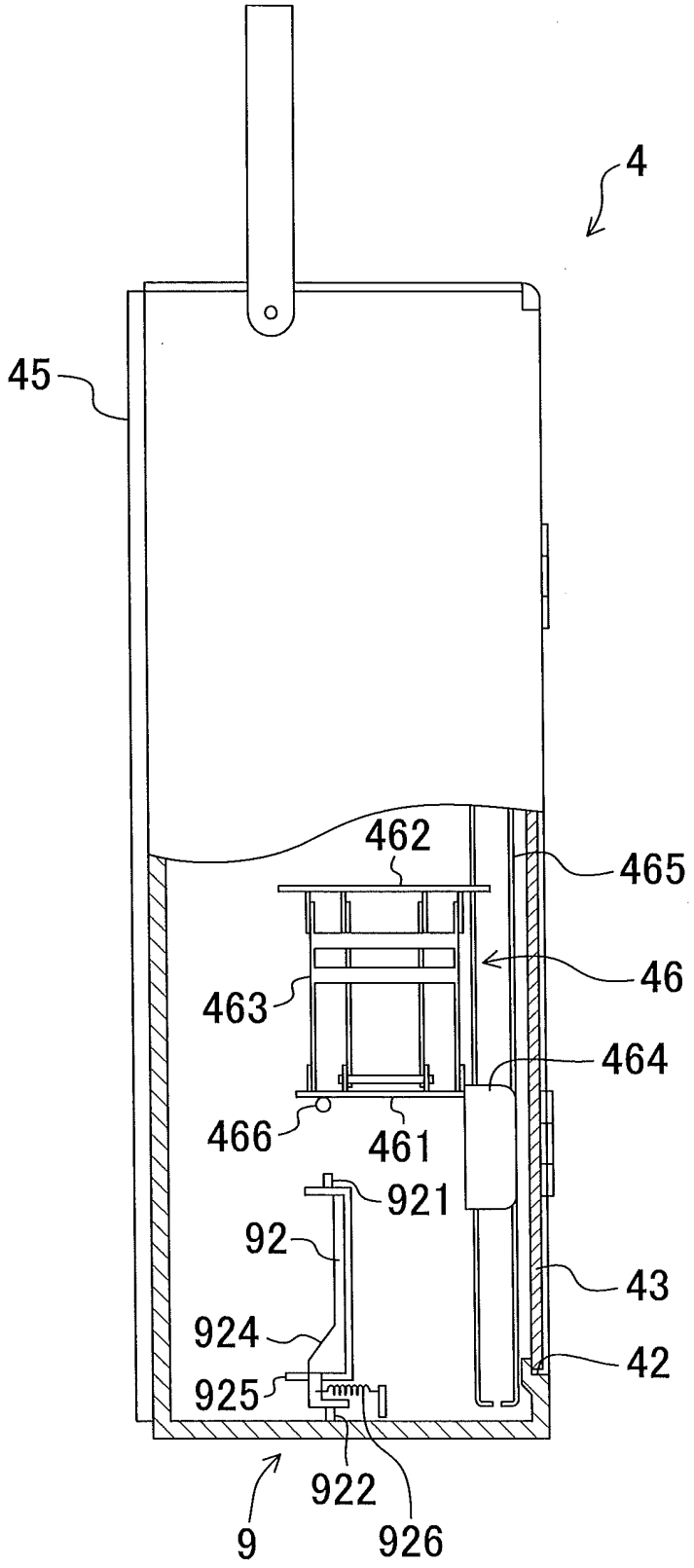


FIG.10

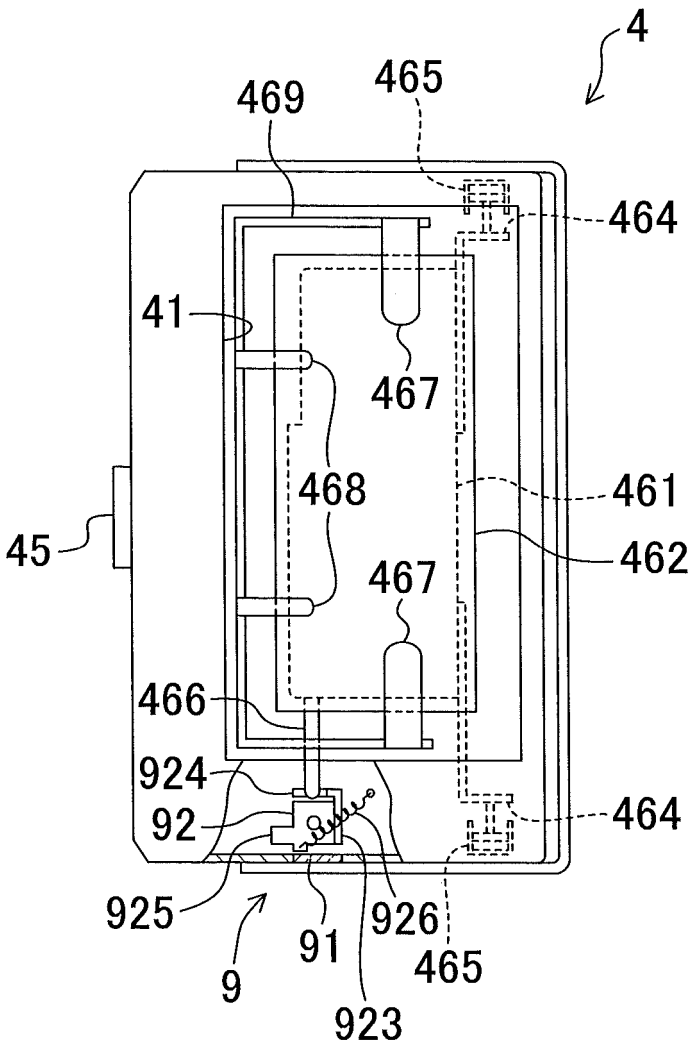

4
469
465
464
41
467
468
461
45
462
467
466
924
92
464
925
91
926
465
9
923

FIG.11

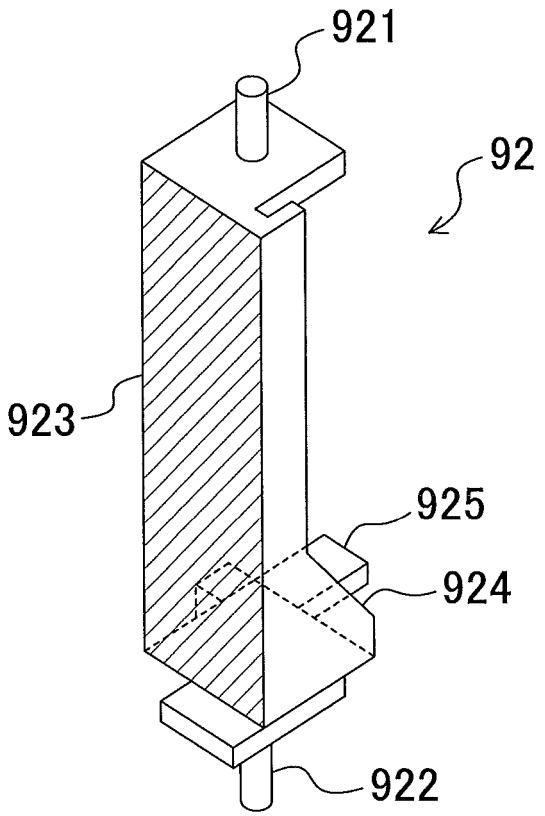


FIG.12

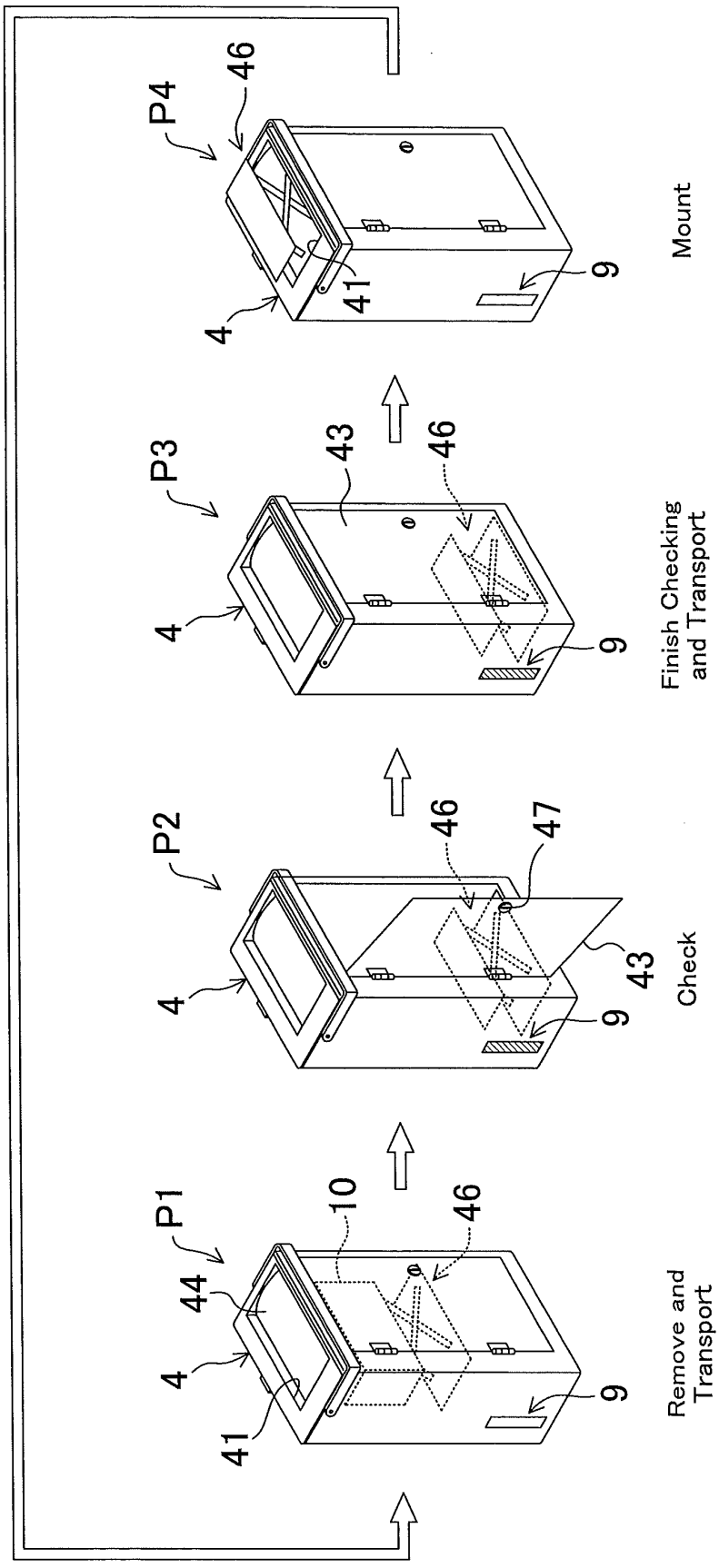

P1
P2
P3
P4
4
9
10
41
43
44
46
47
Remove and Transport
Check
Finish Checking and Transport
Mount

FIG.13

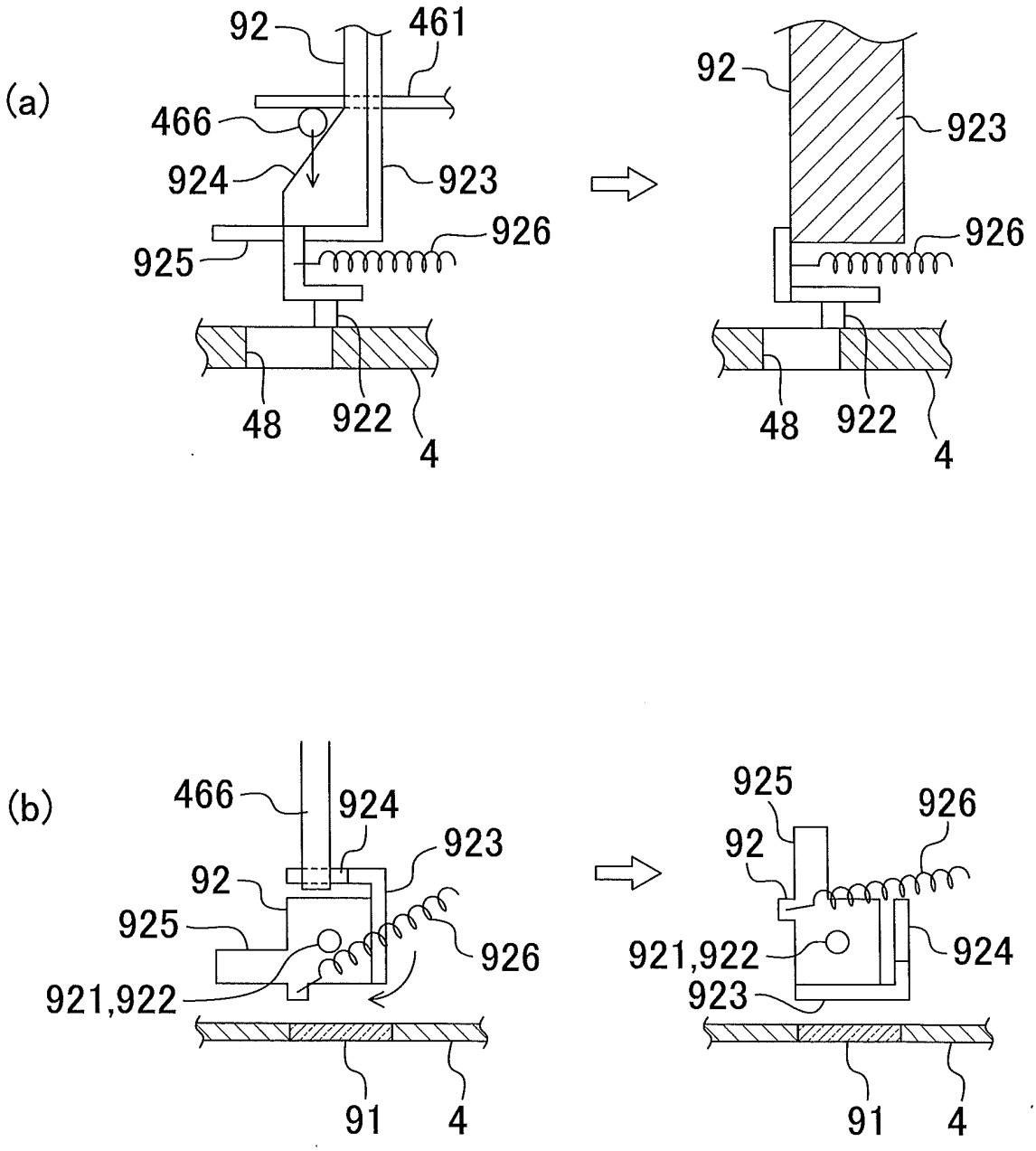

(a)
92
461
466
924
923
926
925
48
922
4
92
923
926
48
922
4
(b)
466
924
923
92
925
926
921,922
91
4
925
926
92
921,922
924
923
91
4

FIG.14

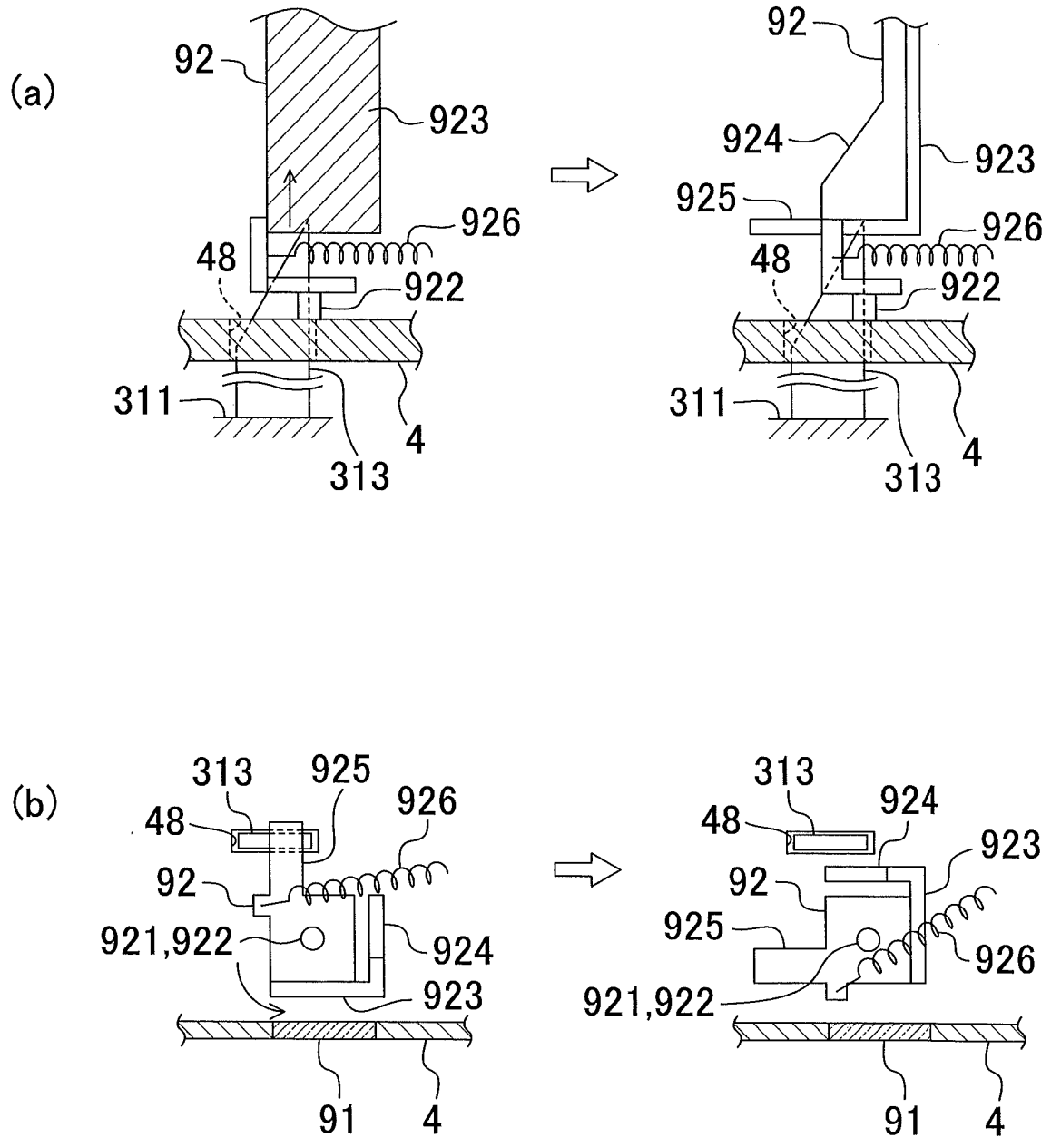

(a)
92
923
926
48
922
311
313
4
92
924
923
925
926
48
922
311
313
4
(b)
313
925
926
48
92
921,922
924
923
91
4
313
924
48
923
92
925
926
921,922
91
4

FIG.15

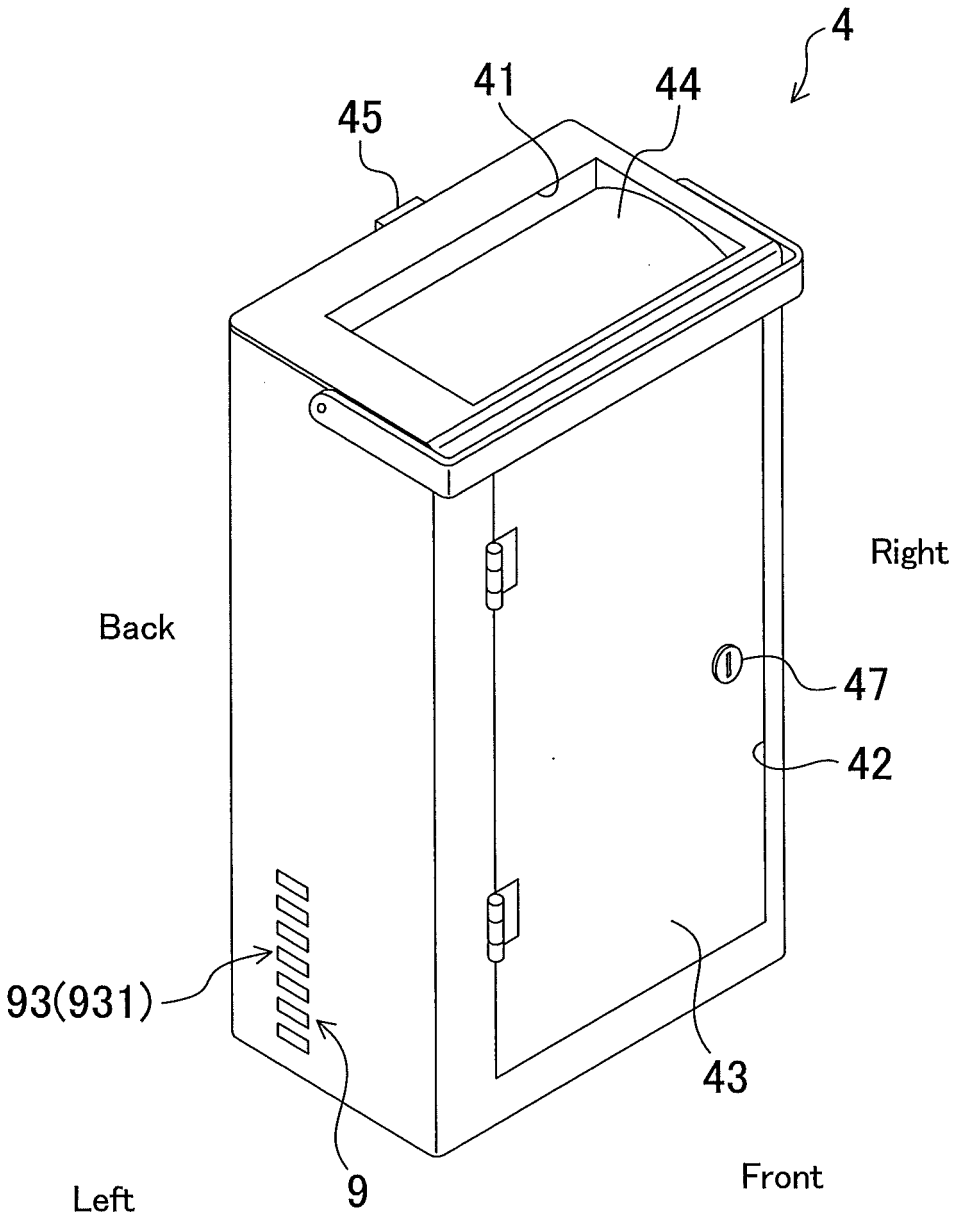


FIG.16

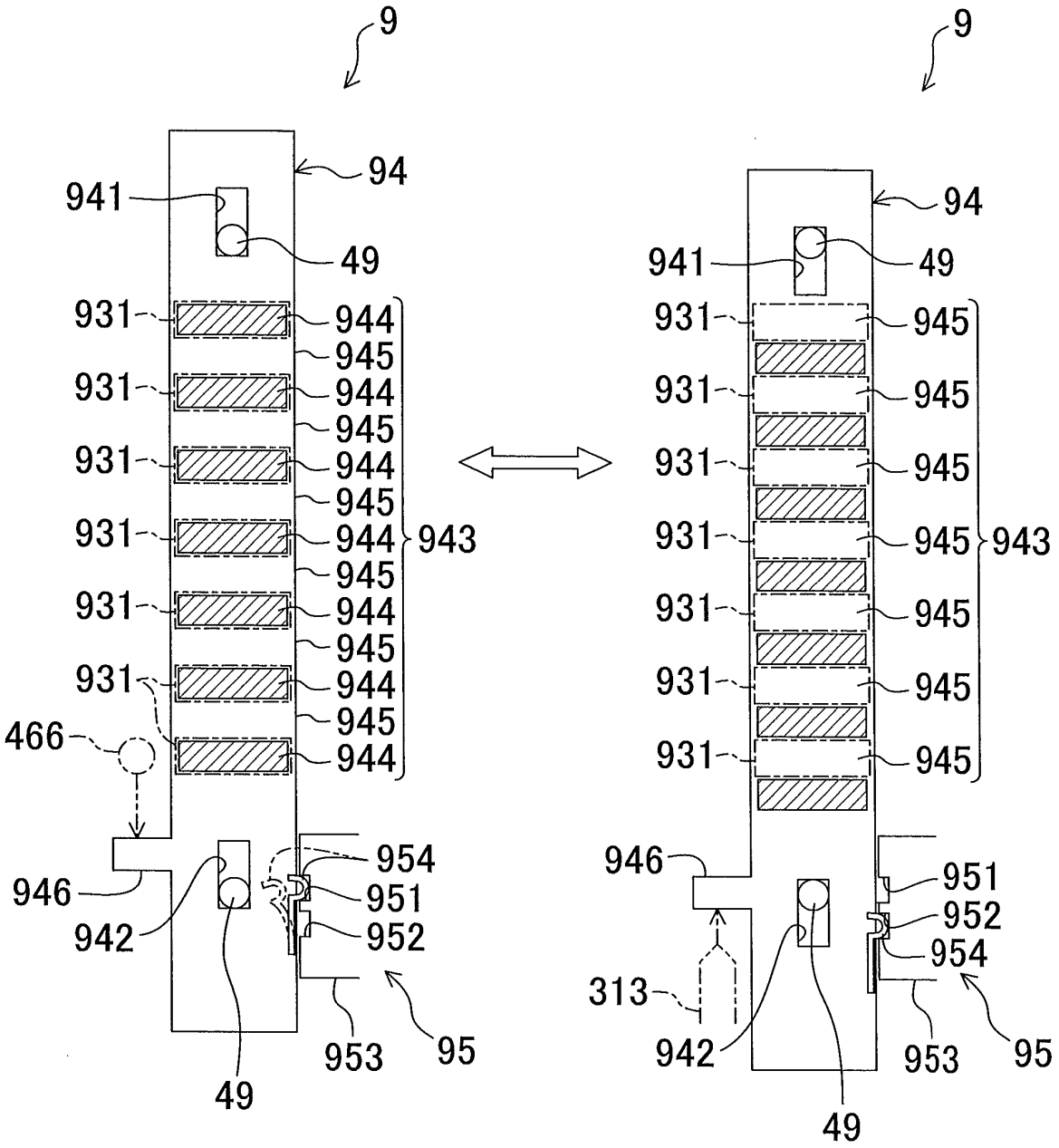


FIG.17

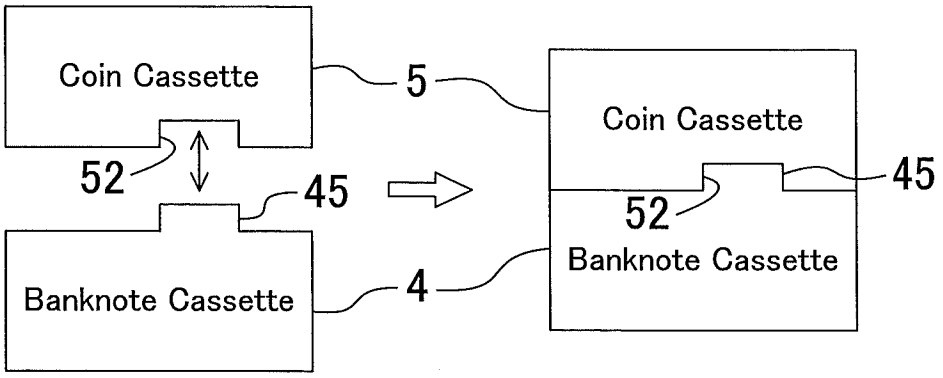

Coin Cassette
5
52
45
Banknote Cassette
4
Coin Cassette
45
52
Banknote Cassette

FIG.18

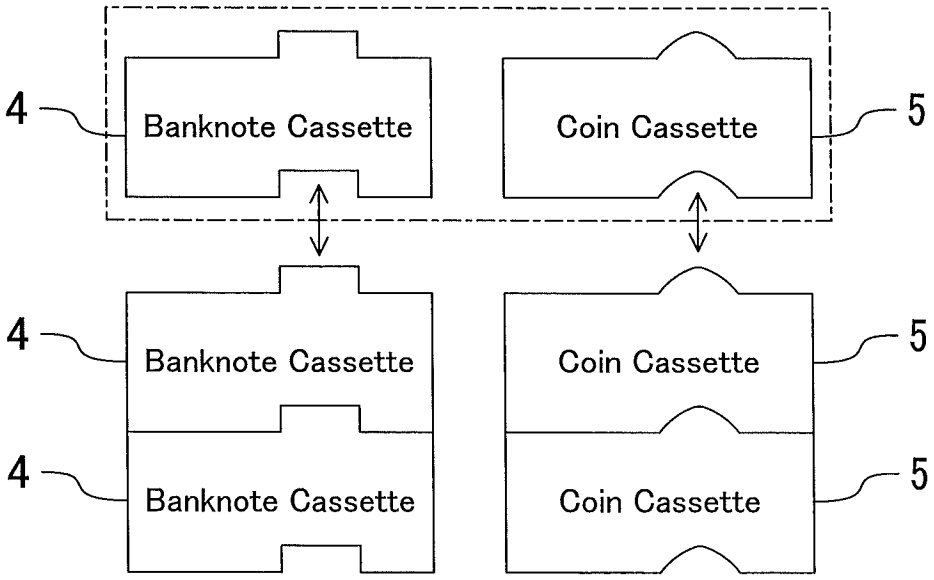

4
Banknote Cassette
Coin Cassette
5
4
Banknote Cassette
Coin Cassette
5
4
Banknote Cassette
Coin Cassette
5

FIG.19

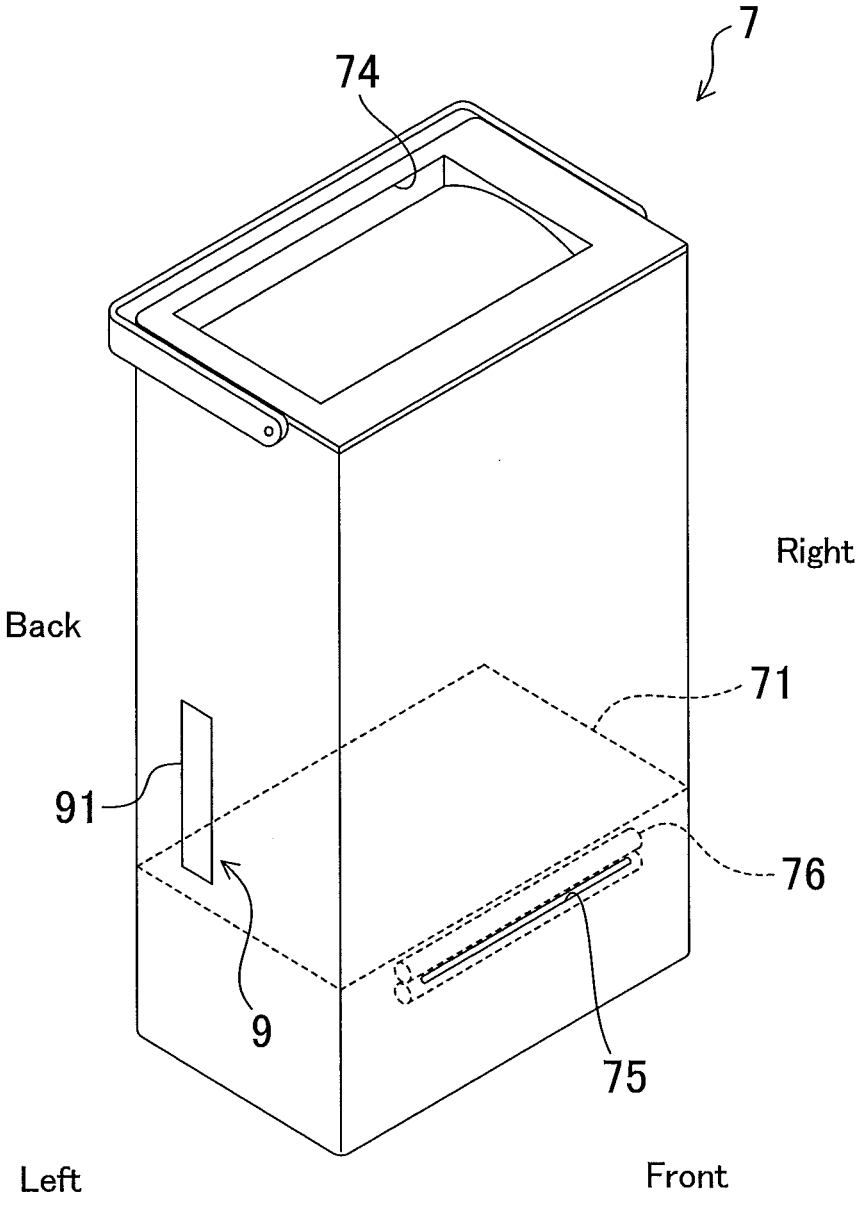


FIG.20

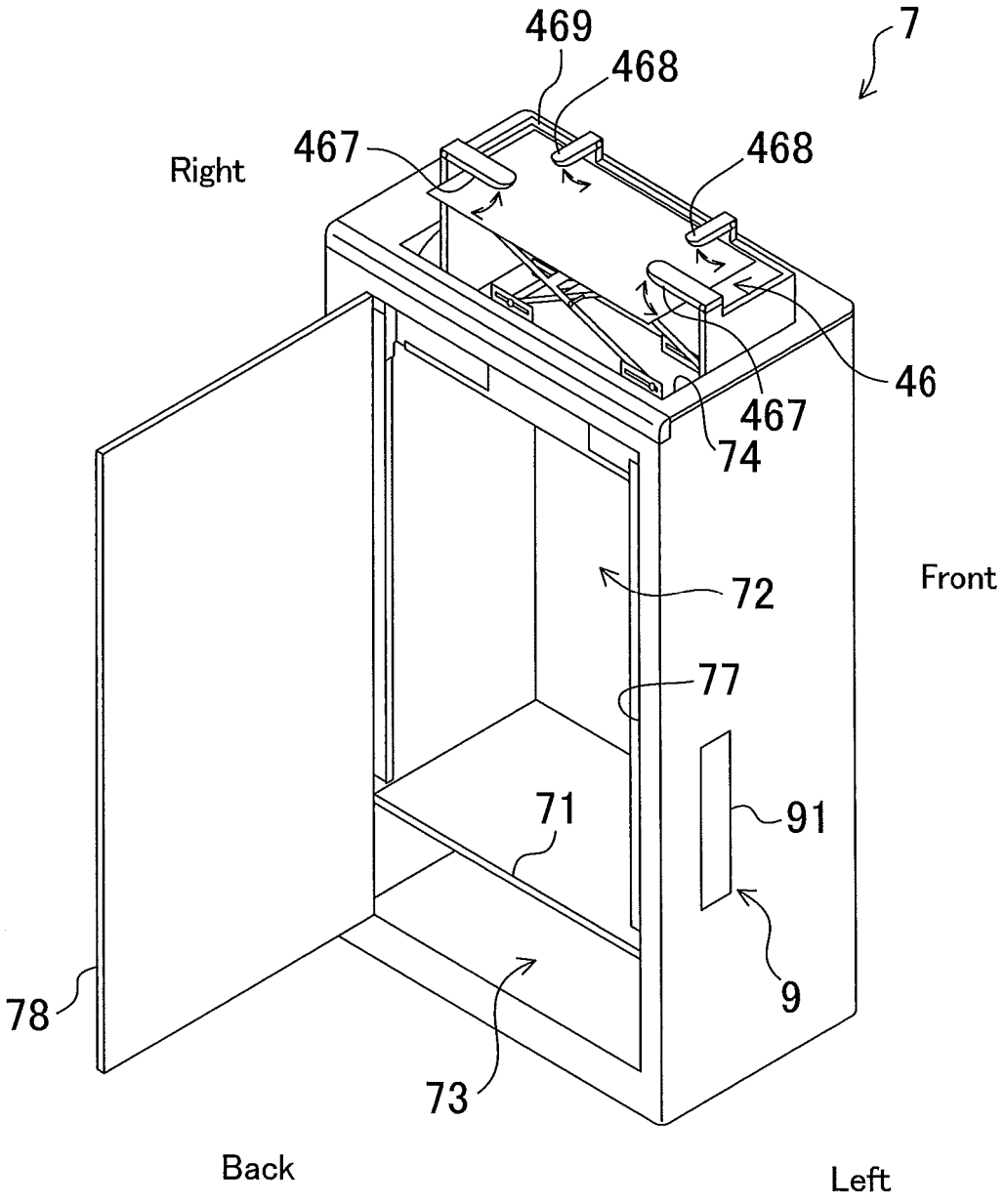

469
468
7
467
Right
468
46
467
74
72
Front
77
71
91
9
78
73
Back
Left

FIG.21

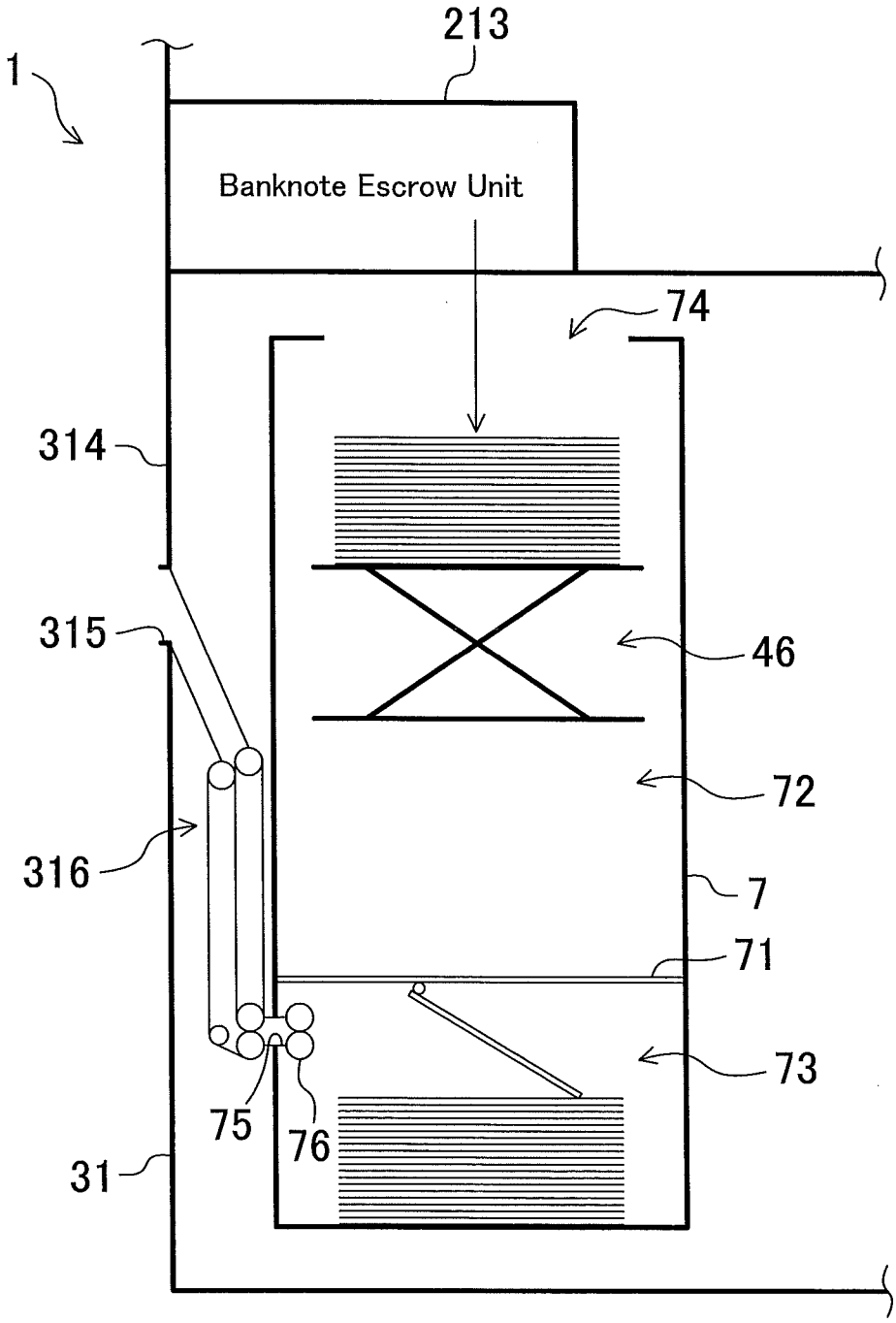


FIG.22

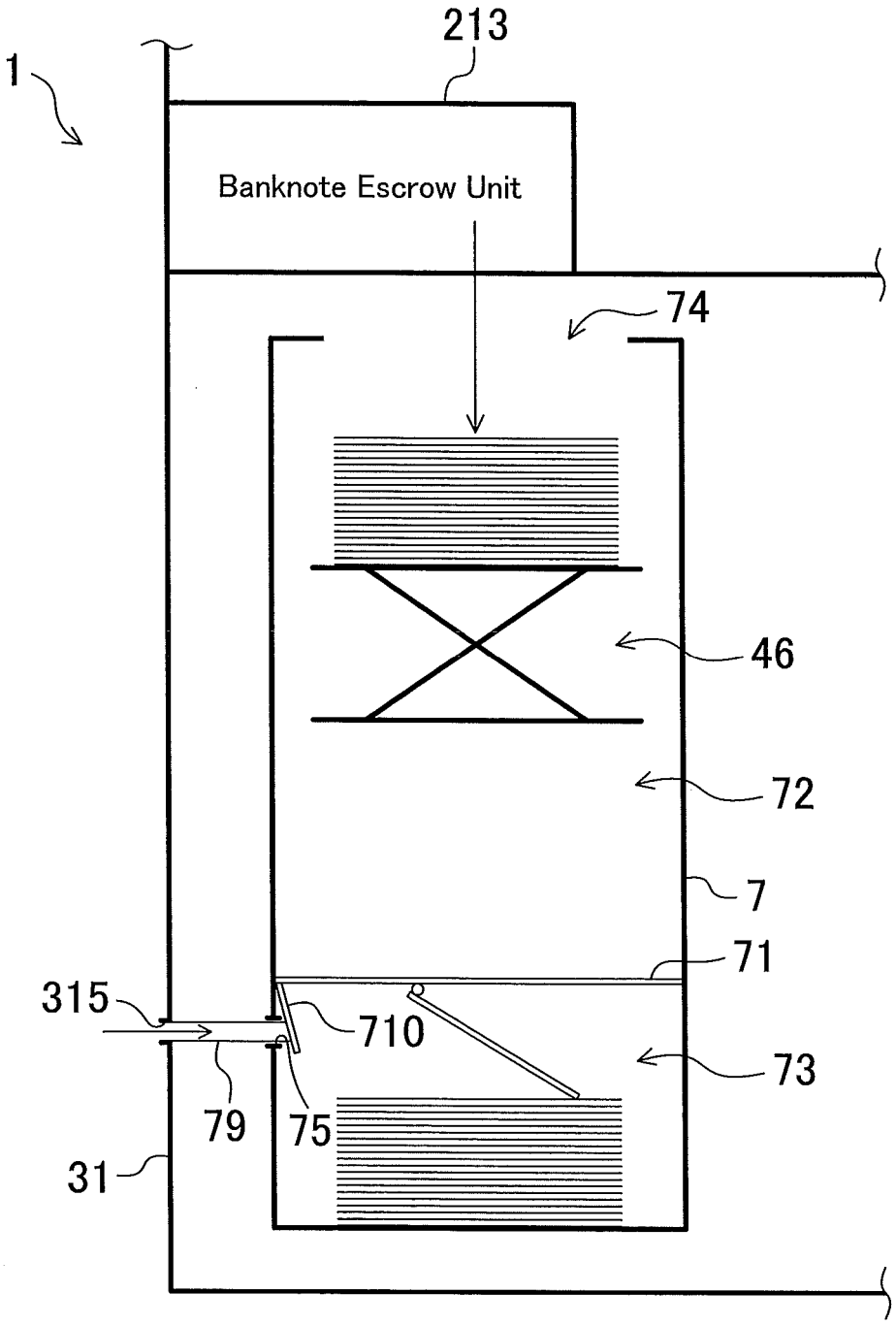
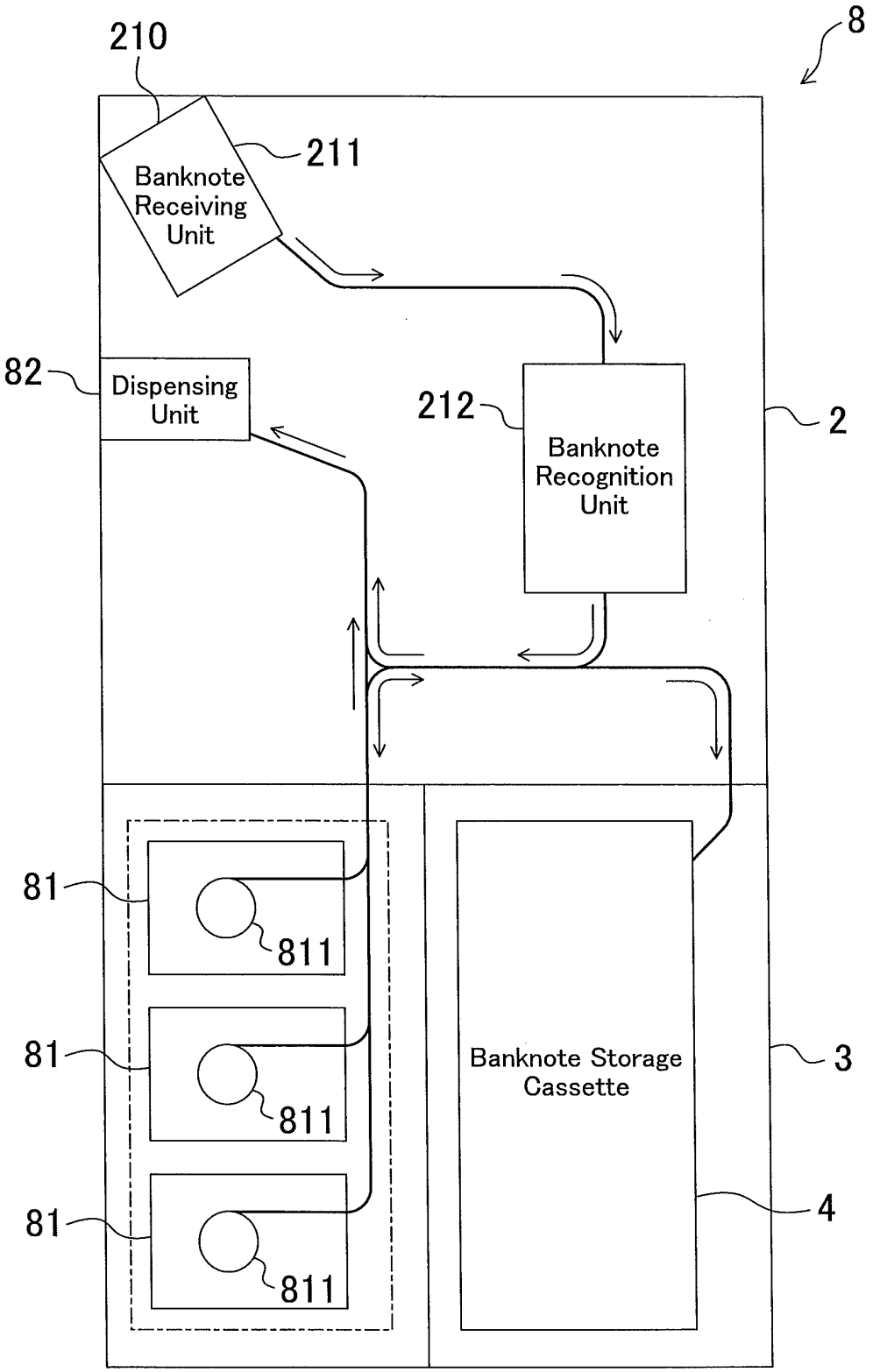


FIG.23


210
8
211
Banknote Receiving Unit
82
Dispensing Unit
212
Banknote Recognition Unit
2
81
811
81
811
81
811
Banknote Storage Cassette
3
4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2007/067516

A. CLASSIFICATION OF SUBJECT MATTER
G07D9/00(2006.01)i

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)
G07D9/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2007
Kokai Jitsuyo Shinan Koho 1971-2007 Toroku Jitsuyo Shinan Koho 1994-2007

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 3971101 B2 (Glory Ltd.), 05 September, 2007 (05.09.07), Par. Nos. [0010], [0011] (Family: none)	1-11
X	JP 3247275 B2 (Glory Ltd.), 15 January, 2002 (15.01.02), Par. Nos. [0037], [0038] (Family: none)	1-11
X	JP 3955440 B2 (Glory Ltd.), 08 August, 2007 (08.08.07), Par. Nos. [0173], [0188] (Family: none)	1-11

☒ 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	Date of mailing of the international search report
04 December, 2007 (04.12.07)	11 December, 2007 (11.12.07)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2007/067516

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2003-132391 A (Kabushiki Kaisha Oizumi), 09 May, 2003 (09.05.03), Par. Nos. [0014], [0015] (Family: none)	1-11

Form PCT/ISA/210 (continuation of second sheet) (April 2007)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 3340176 B **[0009]**
- JP 3247275 B **[0009]**
- JP 7259434 A **[0009]**