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(54) MONEY HANDLING MACHINE

GELDHANDHABUNGSMASCHINE

MACHINE DE MANIPULATION D'ARGENT

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Description

Technical Field

[0001] The present invention relates to a money handling machine that allows depositing and dispensing of money.

Background Art

[0002] Conventionally, money handling machines that perform handling for depositing/dispensing money including banknotes and coins have been known. Examples of money handling machines of this type include, e.g., money changing machines installed in retail shops or restaurants and money depositing and dispensing machines installed in financial institutions.

[0003] A typical money handling machine includes a plurality of storing/feeding units allocated in advance for respective denominations, and transports money deposited from a money receiving unit to, and stores the money in a predetermined storing/feeding unit, and feeds the stored money and dispenses the money from a money dispensing unit. In the money handling machine, in the process of transporting deposited money from the money receiving unit to the storing/feeding units, denomination recognition, authentification and fitness determination of the deposited money are performed, and based on results thereof, the deposited money is sorted and transported to predetermined respective transport destinations (for example, the storing/feeding units, the money dispensing unit or a collection cassette) (for example, Patent Literatures 1 and 2).

[0004] In the below, denomination recognition, fitness determination and authentification of money are collectively referred to as "recognition". Money determined as genuine in authentification is referred to as "genuine money" or "genuine note(s)", and money determined as not genuine (including counterfeit money and suspect money) is referred as "counterfeit money". Also, from among genuine money, money determined as fit for recirculation because of being less stained or damaged in fitness determination is referred to as "fit money", and money determined as unfit for recirculation because of being stained or damaged is referred to as "unfit money". In the case of banknotes, a banknote determined as genuine, a banknote determined as not genuine, a banknote determined as fit for recirculation and a banknote recognized as unfit for recirculation are also referred to "genuine note", "counterfeit note", "fit note" and unfit note", respectively.

[0005] In European financial markets, European Central Bank (ECB) stipulates that if a deposited banknote is recognized as counterfeit note, the counterfeit note should be taken in the money handling machine and keep the money in the money handling machine to prevent recirculation. (Hereinafter, this stipulation is referred to " ECB regulation".) In the future, it is expected that an ECB regulation that is similar to the above will also be applied to coins and will be required even in retail markets.

[0006] However, the money handling machine (coin depositing and dispensing machine) disclosed in Patent Literature 1 is configured so as to, if deposited money is recognized as counterfeit money, return the money to the money dispensing unit as rejected money, and thus, does not comply with the ECB regulation.

[0007] On the other hand, the money handling machine (banknote handling machine) disclosed in Patent Literature 2 is configured so as to, if a deposited banknote is recognized as counterfeit money, prevent the counterfeit money from being returned to the outside of the machine, by, e.g., stopping transport of the counterfeit money at a predetermined position or storing the counterfeit money in a money storage unit (what is called "capture bin") provided in advance for counterfeit money. In other words, an operation complying with the ECB regulation is possible in the money handling machine disclosed in Patent Literature 2.

PTL 3 relates to the field of currency handling systems and, more particularly, to a method and apparatus for processing currency bills using dynamic pocket assignment.

PTL 4 relates to a paper sheet processing apparatus for processing a paper sheet, to the sheet processing system and a sheet processing method.

PTL 5 relates to a banknote handling machine configured to sort and stack banknotes.

Citation List

Patent Literature

[0008]

PTL 1
Japanese Patent Application Laid-Open No. 2012-174039
PTL 2
Japanese Patent Application Laid-Open No. 2012-203666
PTL 3
US 2005/150738 A1
PTL 4
WO 2016/063658 A1
PTL 5
US 2013/220897 A1

Summary of Invention

Technical Problem

[0009] The money handling machine disclosed in Patent Literature 2, for example, performs a procedure for recognizing a banknote deposited into the machine. Each

time the deposited banknote is recognized as counterfeit money, the machine stops transporting the counterfeit money in the machine. It is unfavorable that the machine stops transporting whenever the machine detects the counterfeit money by the recognition because this causes stagnation delay of money depositing/dispensing operations. The machine, also, performs a procedure for storing counterfeit money into a money storage unit of the machine. The machine needs to comprise the money storage unit for counterfeit money storage separately from the storing/feeding units and this causes an increase in size of the machine. Furthermore, as in current retail markets or financial markets in regions other than Europe, where recirculation of counterfeit money is not particularly prohibited and handling of counterfeit money is left up to the provider of the machine, the money handling machine disclosed in Patent Literature 2 can be regarded as having an excessive capability and may be refrained from being introduced. For counterfeit money handling, there can be various regulations that differ depending on countries, regions, markets or clients, other than the ECB regulation, but in the current status, counterfeit money cannot flexibly be handled with a simple machine.

[0010] An object of the present invention is to provide a money handling machine capable of flexibly handling counterfeit money.

Solution to Problem

[0011] A money handling machine according to the present invention according to claim 1 is a machine comprising: a money receiving unit configured to receive money from outside of the money handling machine; a transport unit configured to transport the money received from outside of the money handling machine by the money receiving unit; a recognition unit configured to recognize a denomination and authenticity of the money transported by the transport unit; a plurality of storing/feeding units configured to store the money recognized by the recognition unit and to feed the stored money; a money dispensing unit configured to dispense the stored money fed from the storing/feeding units; and a control unit configured to control the storing/feeding units such that the storing/feeding units store the money recognized by the recognition unit in the storing/feeding units and feed the stored money from the storing/feeding units, characterized in that the money handling machine being provided with a depositing/dispensing mode being selected from a first mode and a second mode, the depositing/dispensing mode which is set to the first mode when the money handling machine is started up, wherein when counterfeit money is recognized by the recognition unit, the control unit is configured to switch the depositing/dispensing mode from the first mode to the second mode and to control the storing/feeding units so as to store the money recognized by the recognition unit in the storing/feeding units allocated for the counterfeit money storage, wherein the control unit is further configured to switch the depositing/dispensing mode to a collection mode in collection processing, wherein in the first mode, the storing/feeding units are allocated for respective denominations and the control unit is configured to permit feeding of the stored money from all of the storing/feeding units, and in the second mode, at least one of the storing/feeding units is allocated for counterfeit money storage and the control unit is configured to prohibit feeding of the stored counterfeit money from the storing/feeding unit allocated for the counterfeit money storage at least during dispensing processing, wherein in the collection processing at a predetermined timing, the control unit is configured to control the storing/feeding units so as to sequentially feed out all of money stored in the storing/feeding unit allocated for counterfeit money storage, the money including the counterfeit money, and to either transport the money to the money dispending unit or to transport the money to a detachable auxiliary storage unit, and wherein upon receipt of an end of collection handling, the control unit is configured to switch the collection mode to the depositing/dispending mode and to switch the depositing/dispensing mode from the second mode to the first mode provided that no money is stored in the storing/feeding unit allocated for counterfeit money storage.

Advantageous Effects of Invention

[0012] A money handling machine according to the present invention is capable of flexibly handling counterfeit money.

Brief Description of Drawings

[0013]

FIG. 1 is a perspective view illustrating an outer appearance of a coin depositing and dispensing machine according to an embodiment of the present invention;

FIG. 2 is a side view illustrating an inner configuration of the coin depositing and dispensing machine illustrated in FIG. 1;

FIG. 3 is a front view illustrating the inner configuration of the coin depositing and dispensing machine illustrated in FIG. 1;

FIG. 4 is a block diagram illustrating a configuration of a control system in the coin depositing and dispensing machine illustrated in FIG. 1;

FIG. 5 is a flowchart illustrating an example of depositing/dispensing handling according to a first embodiment;

FIG. 6 is a flowchart illustrating an example of depositing/dispensing handling according to a second embodiment; and

FIGS. 7A is a side view and a plan view illustrating another example money handling machine.

FIGS. 7B is a side view and a plan view illustrating

another example money handling machine.

Description of Embodiment

[0014] Embodiment of the present invention will be described in detail below with reference to the accompanying drawings.

[The embodiment]

[0015] FIG. 1 is a perspective view illustrating an outer appearance of a coin depositing and dispensing machine 1 according to an embodiment of the present invention. FIG. 2 is a side view illustrating an inner configuration of the coin depositing and dispensing machine 1. FIG. 3 is a front view illustrating the inner configuration of the coin depositing and dispensing machine 1. FIG. 4 is a block diagram illustrating a configuration of a control system in the coin depositing and dispensing machine 1. FIGS. 1 to 4 are used also for description of a coin depositing and dispensing machine 2 according to a non limiting example, which will be described later.

[0016] First, depositing handling, dispensing handling and collection handling in the coin depositing and dispensing machine 1 will briefly be described. Depositing handling is handling for counting the number of deposited coins and confirming the amount of the deposited coins. Dispensing handling is handling for dispensing coins based on prescribed dispensing information. The dispensing information is designated from, for example, an operation/display unit 110 or a higher-ranking machine (external machine). Also, the dispensing information may be an amount to be dispensed or a denomination and number of coins to be dispensed. If the coin depositing and dispensing machine 1 is an automatic change dispenser, dispensing handling includes handling for dispensing change coins. Also, if the coin depositing and dispensing machine 1 is a money changing machine, dispensing handling includes handling for dispensing exchanged coins. Collection handling is handling for collecting coins held inside the machine to the outside of the machine. In collection handling, all of coins held inside the machine may be collected or only a part of coins may be collected. Also, for collection handling, there are a method in which coins are stored in a collection box 70 to collect the coins and a method in which coins are collected from a coin dispensing unit 60.

[0017] As illustrated in FIGS. 1 to 4, the coin depositing and dispensing machine 1 includes, e.g., a coin receiving unit 10, a retaining/feeding unit 20, a deposited money transport unit (transport unit) 30, a plurality of storing/feeding units 40, a dispensed money transport unit 50, the coin dispensing unit 60, the collection box 70, a control unit 100, the operation/display unit 110, a storage unit 120 and a communication unit 130.

[0018] The coin receiving unit 10 is disposed in an upper surface of a casing C and includes a coin inlet facing the outside. In depositing handling, coins deposited by a user are received in the machine from the coin receiving unit 10 and sent to the retaining/feeding unit 20 under its own weight.

[0019] The retaining/feeding unit 20 is disposed below the coin receiving unit 10 inside the casing C and temporarily retains the coins deposited in the coin receiving unit 10 and feeds the retained coins one by one to the deposited money transport unit 30. The retaining/feeding unit 20 includes a centrifugal disk 21 and a cover member 22. The centrifugal disk 21 is disposed so as to be inclined at a predetermined angle relative to a vertical direction and rotates in an inclined position. A coin retaining space 23 that retains coins is formed between the centrifugal disk 21 and the cover member 22.

[0020] The deposited money transport unit 30 is disposed above the retaining/feeding unit 20 inside the casing C and transports the coins fed from the retaining/feeding unit 20, one by one. The deposited money transport unit 30 includes a first deposited money transport part 30A, a loop-back deposited money transport part 30B and a second deposited money transport part 30C. The first deposited money transport part 30A extends along a substantially horizontal direction and transports the coins fed from the retaining/feeding unit 20. The loop-back deposited money transport part 30B has a curved shape (here, semi-arc shape) and reverses a direction of the transport of the coins sent from the first deposited money transport part 30A. The second deposited money transport part 30C extends along the substantially horizontal direction and transports the coins sent from the loop-back deposited money transport part 30B. In FIG. 2, coins fed from the retaining/feeding unit 20 are transported rightward by the first deposited money transport part 30A, a direction of the transport of the coins is changed by the loop-back deposited money transport part 30B, and the coins are then transported leftward by the second deposited money transport part 30C.

[0021] The deposited money transport unit 30 includes, e.g., a transport belt 31, a recognition unit 32, denomination-based sorting units 33, a rejected money sorting unit 34, chutes 36, a drive motor 37 and tracking sensors 35.

[0022] The transport belt 31 is an endless belt looped around a plurality of pulleys (reference numerals thereof omitted). Along with motion of the drive motor 37 attached to one pulley, the transport belt 31 moves so as to circulate in one direction (counterclockwise in FIG. 2). The transport belt 31 includes a plurality of projections arranged at equal distances (illustration thereof omitted). One coin is caught by one projection, whereby coins are transported one by one on a surface of the transport belt 31.

[0023] The recognition unit 32 is disposed on the upstream side in the coin transport direction of the denomination-based sorting units 33 and the rejected money sorting unit 34. The recognition unit 32 performs recognition and/or detection of deposited coins in terms of denomination, authenticity and fitness. In other words, each

of the deposited coins is recognized and/or detected as any of "genuine money", "suspect money" and "counterfeit money", by the recognition unit 32. Each of the "genuine money" is further recognized as either of "fit money" and "unfit money". In the below, where the denomination-based sorting units 33 and the rejected money sorting unit 34 are not distinguished from each other, the denomination-based sorting units 33 and the rejected money sorting unit 34 are referred to as "sorting units 33, 34".

[0024] The denomination-based sorting units 33 are disposed in the first deposited money transport part 30A and the second deposited money transport part 30C. More specifically, three denomination-based sorting units 33 are disposed in the first deposited money transport part 30A, and five denomination-based sorting units 33 are disposed in the second deposited money transport part 30C. The denomination-based sorting units 33 sort the deposited coins by denomination, based on results of the recognition of the coins by the recognition unit 32, and send the deposited coins out toward respective storing/feeding units 40 for the respective denominations of the deposited coins via respective chutes 36 provided so as to be continuous with the denomination-based sorting units 33.

[0025] The rejected money sorting unit 34 is disposed on the upstream side in the coin transport direction of the respective denomination-based sorting units 33 in the first deposited money transport part 30A. The rejected money sorting unit 34 sorts out rejected coins based on the results of the coin recognition by the recognition unit 32 and sends out the rejected coins toward the coin dispensing unit 60 via a chute 36 provided so as to be continuous with the rejected money sorting unit 34. The rejected coins are coins to be subjected to returning handling and are determined based on the results of the recognition by the recognition unit 32. For example, the rejected coins can be coins recognized as counterfeit money or suspect money by the recognition unit 32. Also, the rejected coins may include unfit money. Also, the rejected coins may include coins of a particular denomination the coin depositing and dispensing machine 1 is set not to accept.

[0026] The chutes 36 are provided so as to be continuous with the respective sorting units 33, 34 and causes the coins sent out from the sorting units 33, 34 to slide down. The chutes 36 are disposed, for example, on the opposite side of the dispensed money transport unit 50 with reference to the storing/feeding units 40.

[0027] The tracking sensors 35 are disposed in the vicinity on the upstream side in the coin transport direction of the respective denomination-based sorting units 33 and rejected money sorting unit 34. Each of the tracking sensors 35 is formed of, for example, an optical sensor and detects passage of a deposited coin. Operations of the denomination-based sorting units 33 and the rejected money sorting unit 34 are controlled based on the results of detection by the tracking sensors 35 (timings of passage of the deposited coins).

[0028] The plurality of storing/feeding units 40 are disposed below the deposited money transport unit 30 inside the casing C. In the present embodiment, eight storing/feeding units 40 are disposed in three tiers in the vertical direction (two in the upper tier, two in the intermediate tier and three in the lower tier). The storing/feeding units 40 all have a same configuration. More specifically, each of the storing/feeding units 40 stores coins sent out by the deposited money transport unit 30 via the relevant chute 36, and feeds coins stored therein one by one. Here, the storing/feeding units 40 may be arranged in two tiers or four or more tiers in the vertical direction, and the plurality of storing/feeding units 40 may have mutually-different configurations.

[0029] Each of the storing/feeding units 40 includes a centrifugal disk 41 and a cover member 42. The centrifugal disk 41 is disposed so as to be inclined at a predetermined angle relative to the vertical direction and rotates in an inclined position. A coin storing space 43 that stores coins is formed between the centrifugal disk 41 and the cover member 42.

[0030] A direction of feeding of coins fed from the storing/feeding units 40 is substantially perpendicular to the direction of the transport of coins by the deposited money transport unit 30. More specifically, in FIG. 2, while the direction of the transport of coins by the deposited money transport unit 30 is a direction parallel to the sheet surface of FIG. 2, the direction of feeding of coins fed from the storing/feeding units 40 is a direction perpendicular to the sheet surface.

[0031] A first mode and a second mode are prepared and set in a controller 100 for selectable depositing/dispensing modes, and the controller 100 switches between the first mode and the second mode and selects the one mode as the depositing/dispensing mode. In the first mode, the storing/feeding units 40 are allocated for the respective denominations. The "first mode" is a mode in which normal depositing/dispensing handling is performed. In other words, the first mode is a mode in which none of the plurality of storing/feeding units 40 is allocated for later-described counterfeit money storage and all of the storing/feeding units 40 can feed coins. In the first mode, for example, one storing/feeding unit 40 is allocated for each of 5-yen coin storage, 50-yen coin storage, 100-yen coin storage and 500-yen coin storage, and two storing/feeding units 40 are allocated for each of 1-yen coin storage and 10-yen coin storage. On the other hand, in the second mode, at least one of the storing/feeding units 40 is allocated for counterfeit money storage. The "second mode" is a mode in which if counterfeit money deposited to the machine is detected by the recognition unit 32 in depositing handling, the counterfeit money is kept in the machine and not returned to a depositor to prevent recirculation of the counterfeit money, and is made selectable upon detection of counterfeit money.

[0032] If counterfeit money is detected by the recognition unit 32 and the second mode is selected by the controller 30, for example, one of the storing/feeding units

40 for 1-yen coin storage and the storing/feeding units 40 for 10-yen coin storage is allocated for counterfeit money storage.

[0033] In dispensing handling or collection handling, the dispensed money transport unit 50 transports coins fed from the respective storing/feeding units 40 to the coin dispensing unit 60. The dispensed money transport unit 50 includes a first dispensed money transport part 50A and a second dispensed money transport part 50B (see FIG. 2). The first dispensed money transport part 50A extends in the substantially horizontal direction below the storing/feeding units 40. The second dispensed money transport part 50B transports coins sent from the first dispensed money transport part 50A to the coin dispensing unit 60.

[0034] The dispensed money transport unit 50 includes, e.g., a transport belt 51 and a drive motor (reference numeral thereof omitted). The transport belt 51 is an endless belt looped around a plurality of pulleys (reference numerals thereof omitted). Along with motion of the drive motor attached to one pulley, the transport belt 51 moves so as to circulate clockwise or counterclockwise. The transport belt 51 includes a plurality of projections (illustration thereof omitted) arranged at equal distances. One coin is caught by one projection, whereby coins are transported one by one on a transport surface.

[0035] Coins fed from the storing/feeding units 40 are sent out toward the side on which the dispensed money transport unit 50 is disposed (right side in FIG. 3), drop down onto the transport belt 51 in the first dispensed money transport part 50A and are transported clockwise or counterclockwise. For example, the transport belt 51 rotates counterclockwise in FIG. 2 where the coins fed from the storing/feeding units 40 are transported to the coin dispensing unit 60, and rotates clockwise in FIG. 2 where the coins are transported to the collection box 70.

[0036] The coin dispensing unit 60 is disposed in a front surface of the casing C and includes a coin outlet facing the outside. The coins transported by the dispensed money transport unit 50 are dispensed to the coin dispensing unit 60 and removed from the user.

[0037] Here, the coin depositing and dispensing machine 1 may also include a rejection unit for returning rejected coins to the outside of the machine, separately from the coin dispensing unit 60. A return outlet of the rejection unit is provided, for example, in the vicinity of the coin outlet.

[0038] The collection box 70 is an auxiliary storage unit disposed below the dispensed money transport unit 50 inside the casing C. The collection box 70 is detachably provided in the casing C. The collection box 70 is used in collection handling. Also, the collection box 70 is used in overflow handling in which coins overflowed from the storing/feeding units 40 are transported to the collection box 70 by the dispensed money transport unit 50. Processing for collecting overflowed coins together with the collection box 70 is also included in collection handling. The user removes the collection box 70 from the casing C and can thereby collect collectable coins together with the collection box 70. The collection box 70 can also be used for collecting counterfeit money received in the relevant storing/feeding unit 40 in the second mode.

[0039] The control unit 100 includes, e.g., a CPU (central processing unit) 101, which serves as an arithmetic/control unit, a ROM (read-only memory) 102, which is a main memory unit, and a RAM (random access memory) 103. The ROM 102 stores a basic program such as a BIOS (basic input/output system) and basic setting data. The CPU 101 reads a program according to the content of processing from the ROM 102 or the storage unit 120, develops the program in the RAM 103 and executes the developed program, and thereby performs centralized control of operations of respective blocks in the coin depositing and dispensing machine 1.

[0040] The operation/display unit 110 is formed of, for example, a touch screen-equipped flat panel display. For the flat panel display, e.g., a liquid-crystal display or an organic EL display can be used. Although not illustrated in FIG. 1, the operation/display unit 110 is attached, for example, behind the coin receiving unit 10 in the upper surface of the casing C. Also, the operation/display unit 110 may be a unit that is separate from the body of the coin depositing and dispensing machine 1 and be connected to the body of the coin depositing and dispensing machine 1 via a wire or wirelessly. Also, an operation/display unit of a banknote depositing and dispensing machine or a POS register connected to the coin depositing and dispensing machine 1 may be used as the operation/display unit 110 of the coin depositing and dispensing machine 1. The operation/display unit 110 displays information and receives an operation instruction provided by the user, and outputs operation information to the control unit 100. For example, where counterfeit money is detected, the operation/display unit 110 displays, e.g., information relating to handling of the counterfeit money.

[0041] The storage unit 120 is, for example, an auxiliary storage unit such as an HDD (hard disk drive) or an SSD (solid state drive). The storage unit 120 stores, e.g., an operating system (OS), a depositing/dispensing processing program and data relating to depositing/dispensing processing.

[0042] The depositing/dispensing processing program is provided via, for example, a computer-readable portable storage medium (which includes an optical disk, a magneto-optical disk or a memory card) with the program stored therein. Also, for example, the depositing/dispensing processing program may be provided by being downloaded from a server machine (external machine) holding the depositing/dispensing processing program via a network. Also, the depositing/dispensing processing program may be stored in the ROM 102.

[0043] Examples of the data relating to depositing/dispensing processing include, e.g., setting data for each storing/feeding unit 40, data on the number of coins of the relevant denomination stored in each storing/feeding

unit 40, a flag indicating that the relevant storing/feeding unit 40 is allocated for counterfeit money storage, a flag indicating whether or not coins can be fed from each storing/feeding unit 40 and a flag indicating the depositing/dispensing mode (first mode/second mode). Example of the setting data for each storing/feeding unit 40 include, e.g., ID data provided so as to enable identification of the storing/feeding unit 40, location data indicating a location of the storing/feeding unit 40 and data on a denomination allocated to the storing/feeding unit 40.

[0044] The communication unit 130 is, for example, a communication interface such as an NIC (network interface card), a modem (modulator-demodulator) or an USB (universal serial bus). The control unit 100 transmits/receives various data to/from an external machine connected to a network such as a wired/wireless LAN, via the communication unit 130. For the communication unit 130, a communication interface for short-distance wireless communication such as NFC (near-field communication) or Bluetooth (registered trademark) can also be employed.

[0045] The control unit 100 executes the depositing/dispensing processing program stored in the storage unit 120, and if the recognition unit 32 detects counterfeit money , the control unit 100 guides the counterfeit money to a proper transport destination. In the first embodiment, when the coin depositing and dispensing machine 1 is started up, the depositing/dispensing mode is set to "first mode" in the controller 100 in advance and the controller 100 performs normal depositing/dispensing handling in the first mode. And when the recognition unit 32 detects counterfeit money during execution of the depositing/dispensing processing program, the controller 100 automatically switches the depositing/dispensing mode from the first mode to the second mode and performs depositing/dispensing handling in the second mode at least until finishing collection of the counterfeit money. Also, during collection of coins (which means that at the time from starting to finishing collecting the counterfeit money into a storing/feeding unit 40 for counterfeit money storage), the depositing/dispensing mode is switched to a collection mode.

[0046] FIG. 5 is a flowchart illustrating an example of depositing handling according to the first embodiment. This handling is performed, for example, upon the CPU 101 executing the depositing/dispensing handling program stored in the storage unit 120 along with power-on of the coin depositing and dispensing machine 1.

[0047] As illustrated in FIG. 5, in step S101, the control unit 100 acquires a result of recognition of a deposited coin by the recognition unit 32. The control unit 100 can recognize a denomination and authenticity of the deposited coin based on the result of recognition by the recognition unit 32. Also, the control unit 100 may recognize fitness of the deposited coin.

[0048] In step S102, the control unit 100 recognizes whether or not the deposited coin is counterfeit money. If the deposited coin is counterfeit money ("YES" in step S102), the processing transitions to the processing in step S103. If the deposited coin is not counterfeit money ("NO" in step S102), that is, if the deposited coin is genuine money regardless of whether or not the deposited coin is fit money or unfit money, the processing transitions to the processing in step S108.

[0049] In step S103, the control unit 100 determines whether or not the current depositing/dispensing mode is the first mode. If the current depositing/dispensing mode is the first mode, the processing transitions to the processing in step S104. If the current depositing/dispensing mode is the second mode, that is, if a storing/feeding unit 40 for counterfeit money storage has already been set, the processing transitions to the processing in step S107.

[0050] Here, feeding of coins from the storing/feeding unit 40 set for counterfeit money storage is prohibited at least in dispensing handling, enabling reliable prevention of recirculation of counterfeit money. Therefore, in the below description, the storing/feeding unit 40 set for counterfeit money storage is referred to as "capture bin 40CB".

[0051] In step S104, the control unit 100 switches the flag indicating the depositing/dispensing mode from the first mode to the second mode.

[0052] In step S105, the control unit 100 determines the capture bin 40CB to be allocated for counterfeit money storage from among the plurality of storing/feeding units 40, based on a predetermined condition. The predetermined condition is set in advance by, for example, the user performing an operation to select any of a plurality of options on a list displayed on the operation/display unit 110, and is stored in the storage unit 120. Examples of the plurality of options include first to sixth conditions indicated below.

[First condition]

[0053] The first condition is a condition on a distance between the recognition unit 32 and a denomination-based sorting unit 33 (diverter unit) that diverts a coin transported by the deposited money transport unit 30 to a storing/feeding unit 40. For example, a storing/feeding unit 40 that stores coins sorted out by a denomination-based sorting unit 33 closest to the recognition unit 32 is set as the capture bin 40CB.

[0054] If counterfeit money is poor in quality, there is a fear that a transport failure occurs in the process of transport of the counterfeit money by the deposited money transport unit 30. Setting the capture bin 40CB based on the first condition enables minimization of occurrence of such transport failure. Also, in the second mode, the capture bin 40CB cannot be used for dispensing handling, and thus, it is preferable that counterfeit money stored in the capture bin 40CB be collected early and depositing/dispensing mode be returned to the first mode.

[Second condition]

[0055] The second condition is a condition on the denominations allocated to the storing/feeding units 40 in the first mode. For example, a storing/feeding unit 40 that stores coins of a largest denomination (here, 500 yen) in the first mode is set as the capture bin 40CB.

[0056] The number of coins of the largest denomination that are fed in dispensing handling is smaller than those of the other denominations. Thus, where the capture bin 40CB is set based on the second condition, coins of the denomination for which the storing/feeding units 40 set as the capture bin 40CB had been allocated are less likely to be needed as coins to be dispensed, and even if counterfeit money is not promptly collected after storing of the counterfeit money, the coin depositing and dispensing machine 1 can tolerate continuing operation. Therefore, setting the capture bin 40CB based on the second condition enables prevention of a decrease in operational efficiency caused as a result of counterfeit money being taken in. Also, in order to more reliably prevent a decrease in operational efficiency, it is preferable that counterfeit money stored in the capture bin 40CB be collected early and the depositing/dispensing mode be returned to the first mode.

[Third condition]

[0057] The third condition is a condition on the number of coins stored in each storing/feeding unit 40 at the time of switching to the second mode. More specifically, at the point of time of switching to the second mode, a storing/feeding unit 40 whose number of coins stored therein is largest is set as the capture bin 40CB.

[0058] The storing/feeding unit 40 whose number of coins stored therein is largest is a storing/feeding unit 40 whose number of coins fed therefrom is relatively small. Therefore, if a storing/feeding unit 40 whose number of coins stored therein is largest is set as the capture bin 40CB, as in the case where the capture bin 40CB is set based on the second condition, the stored counterfeit money is less likely to be fed out early. Accordingly, setting the capture bin 40CB based on the third condition enables prevention of a decrease in operational efficiency caused as a result of counterfeit money being taken in. Also, in order to more reliably prevent a decrease in operational efficiency, it is preferable that counterfeit money stored in the capture bin 40CB be collected early and the depositing/dispensing mode be returned to the first mode.

[Fourth condition]

[0059] As with the third condition, the fourth condition is a condition on the number of coins stored in a storing/feeding unit 40 at the point of time of switching to the second mode. More specifically, at the point of time of switching to the second mode, a storing/feeding unit 40 whose number of coins stored therein is smallest is set as the capture bin 40CB.

[0060] If a storing/feeding unit 40 whose number of coins stored therein is small is set as the capture bin 40CB, counterfeit money can easily be sorted out from the coins stored therein. Therefore, setting the capture bin 40CB based on the fourth condition enables enhancement in efficiency of counterfeit money collection handling. Here, the capture bin 40CB is a storing/feeding unit 40 whose number of coins stored therein is small and whose number of coins fed therefrom is relatively large in dispensing handling in the first mode. In other words, coins of the denomination for which the storing/feeding unit 40 set as the capture bin 40CB had been allocated are highly likely to be needed as coins to be dispensed. Accordingly, in order to prevent a decrease in operational efficiency, it is preferable that counterfeit money stored in the capture bin 40CB be collected early and the depositing/dispensing mode be returned to the first mode. Furthermore, in order to more reliably prevent a decrease in operational efficiency, it is preferable that after counterfeit money is stored in the capture bin 40CB, the operation be stopped at the point of time of completion of depositing/dispensing handling for money including the counterfeit money and the counterfeit money be collected. Also, for handling for collecting counterfeit money from the capture bin 40CB, it is preferable to employ a method in which coins stored in the capture bin 40CB are transported to the coin dispensing unit 60 and collected.

[Fifth condition]

[0061] The fifth condition is a condition on a location of a storing/feeding unit 40 in the casing C. For example, a storing/feeding unit 40 installed at a location that can easily be accessed after opening a door of the casing C is set as the capture bin 40CB.

[0062] If a storing/feeding unit 40 installed at a position that can easily be accessed is set as the capture bin 40CB, the capture bin 40CB can easily be accessed. Therefore, setting the capture bin 40CB based on the fifth condition enables collecting only counterfeit money from the capture bin 40CB without collecting all of coins including the counterfeit money and this enables enhancement in efficiency of counterfeit money collection handling. Also, in order to more reliably prevent a decrease in operational efficiency, it is preferable that counterfeit money stored in the capture bin 40CB be collected early and the depositing/dispensing mode be returned to the first mode.

[Sixth condition]

[0063] The sixth condition is a condition on the number of storing/feeding units 40 allocated for a same denomination. For example, if a plurality of storing/feeding units 40 are allocated for a same denomination, one of the

plurality of storing/feeding units 40 is set as the capture bin 40CB.

[0064] If one of storing/feeding units 40 allocated for a same denomination is set as the capture bin 40CB, feeding of coins from the capture bin 40CB is prohibited (except feeding of coins for collection), so enabling recirculation of counterfeit money to be reliably prevented, and coins of the relevant denomination to be fed from another storing/feeding unit 40 and dispensed. Also, a timing for collecting counterfeit money is less limited than those of cases where the capture bin 40CB is set based on any of the first to fifth conditions above. Therefore, setting the capture bin 40CB based on the sixth condition enables the user to perform a normal depositing/dispensing operation as in the first mode, with no obstacles to the depositing/dispensing operation caused as a result of counterfeit money being taken in. Also, genuine money can be stored in a storing/feeding unit 40 not set as the capture bin 40CB from among the storing/feeding units 40 allocated for the same denomination, and transport of genuine money to the capture bin 40CB can be prohibited, enabling enhancement in efficiency of collecting counterfeit money.

[0065] As in the present embodiment, where a plurality of storing/feeding units 40 are allocated for a same denomination (here, for each of 1 yen and 10 yen), setting the capture bin 40CB based on the sixth condition can be considered as optimum.

[0066] Also, it is possible that the first to sixth conditions are prioritized and arbitrarily combined to set the capture bin 40CB. Also, the methods for setting the capture bin 40CB are not limited to those described above and may include other types of methods. For example, if a denomination of detected counterfeit money has been recognized, a storing/feeding unit 40 other than a storing/feeding unit 40 allocated for the denomination may be set as the capture bin 40CB. In this case, the user can easily sort out the counterfeit money from coins stored in the capture bin 40CB.

[0067] Upon determination of the storing/feeding unit 40 allocated for the capture bin 40CB as described above, in step S106, the control unit 100 controls a notification unit (for example, the operation/display unit 110) to notify the user of the switching of the depositing/dispensing mode to the second mode and the counterfeit money being taken into the machine. In this case, notification of, e.g., an ID of the storing/feeding unit 40 set as the capture bin 40CB, a location of the storing/feeding unit 40 and a denomination allocated to the storing/feeding unit 40 may be provided together with the fact that counterfeit money has been taken into the machine. Consequently, the user can become aware of counterfeit money being taken into the machine and can also become aware of a need to perform counterfeit money collection handling.

[0068] Also, a sound output unit or an LED, which functions as the notification unit, may be provided in the coin depositing and dispensing machine 1 to provide a notification of counterfeit money being taken into the machine by means of a sound or light emission.

[0069] In step S107, the control unit 100 controls the operation of the deposited money transport unit 30 (relevant denomination-based sorting unit 33) according to the second mode to transport the counterfeit money to the capture bin 40CB. Consequently, the counterfeit money is not returned and taken into the machine. The counterfeit money taken into the machine is arbitrarily collected, enabling prevention of recirculation of the counterfeit money. In principle, counterfeit money is not added to a deposited amount, but may be added to a deposited amount in exceptional cases such as a case where a denomination of the counterfeit money is low.

[0070] In step S108, the control unit 100 controls the operation of the deposited money transport unit 30 (denomination-based sorting units 33) to transport the deposited coin to a relevant one of the storing/feeding units 40 allocated for the respective denominations or the capture bin 40CB. More specifically, if a deposited coin that is genuine money is received in the first mode and the second mode ("NO" in step S102), the deposited coin is transported to a relevant one of the storing/feeding units 40 allocated for the respective denominations. The denomination allocated in the first mode is still allocated to the storing/feeding unit 40 set as the capture bin 40CB in the second mode. If genuine money is received in the second mode, the genuine money may still be stored even to the storing/feeding unit 40 set as the capture bin 40CB. However, this does not apply to the case where the capture bin 40CB is set based on the sixth condition. Also, if counterfeit money is received in the second mode ("NO" in step S103), the counterfeit money is transported to the storing/feeding unit 40 set as the capture bin 40CB.

[0071] Here, if the deposited coin is unfit money, the deposited coin may be transported to the storing/feeding unit 40 allocated for the denomination of that coin or may be returned to the coin dispensing unit 60.

[0072] Handling for depositing coins including counterfeit money is performed in such as a manner as described above. The depositing handling is repeated each time a coin is deposited from the coin receiving unit 10.

[0073] The counterfeit money stored in the capture bin 40CB can be collected as follows, for example, at the point of time of completion of depositing/dispensing handling for money including the counterfeit money, the point of time of an end of the depositing/dispensing service (the point of time of the coin depositing and dispensing machine 1 being powered off) or a predetermined timing. In depositing/dispensing handling, where it is necessary to feed coins from the storing/feeding unit 40 allocated for the capture bin 40CB, an instruction to collect the counterfeit money may be provided before feeding coins from the storing/feeding unit 40. Upon receipt of an instruction for collection handling from the operation/display unit 110 or the higher-ranking machine (external machine), for example, the coin depositing and dispensing machine 1 shifts to the collection mode for collecting

coins.

[0074] In the collection mode, the control unit 100 may cause, for example, all of coins, including counterfeit money, stored in the capture bin 40CB to be sequentially fed out and dispensed from the coin dispensing unit 60. The user can collect the counterfeit money by sorting out the counterfeit money from the dispensed coins.

[0075] Also, for example, the control unit 100 may cause all of coins, including counterfeit money, stored in the capture bin 40CB to be sequentially fed out and transported to the collection box 70. The user removes the collection box 70 from the coin depositing and dispensing machine 1 and sorts out the counterfeit money from the stored coins, and thereby can collect the counterfeit money. In this case, overflowed coins may be stored in the collection box 70, and thus, it is preferable that the collection box 70 be changed to a vacant collection box 70 before collection of the counterfeit money and only the coins stored in the capture bin 40CB be collected into the vacant collection box 70.

[0076] Also, for example, the user can collect the counterfeit money directly manually from the capture bin 40CB.

[0077] Upon, for example, receipt of an end of collection handling from the operation/display unit 110 or the higher-ranking machine (external machine), the coin depositing and dispensing machine 1 transitions to the depositing/dispensing mode. In this case, it is preferable that the coin depositing and dispensing machine 1 newly returns to the first mode, rather than a state before the collection (second mode). Consequently, feeding of coins from the storing/feeding unit 40 allocated to the capture bin 40CB is allowed provided that counterfeit money is collected, that is, no money is stored in the storing/feeding unit 40.

[0078] As described above, the coin depositing and dispensing machine 1 (money handling machine) according to the first embodiment includes: the coin receiving unit 10 (money receiving unit) that receives money from the outside of the machine; the deposited money transport unit 30 (transport unit) that transports the money deposited from the money receiving unit 10; the recognition unit 32 that recognizes a denomination and authenticity of the money transported by the deposited money transport unit 30; a plurality of storing/feeding units 40 capable of storing the money and feeding out the money stored therein; the coin dispensing unit 60 (money dispensing unit) that dispenses the money fed from the storing/feeding units 40; and the control unit 100 that controls storing of money in the plurality of storing/feeding units 40 and feeding of money from the plurality of storing/feeding units 40. A first mode and a second mode are set for selectable depositing/dispensing modes, in the first mode, the plurality of storing/feeding units (40) are allocated for respective denominations, and in the second mode, at least one of the plurality of storing/feeding units is allocated for counterfeit money storage. The control unit 100 controls storing and feeding of money according to a selected one of the first mode and the second mode.

[0079] Also, the control unit 100 makes switching from the first mode to the second mode provided that counterfeit money is detected by the recognition unit 32.

[0080] According to the coin depositing and dispensing machine 1, upon detection of counterfeit money, the first mode is shifted to the second mode, and the counterfeit money is stored in the capture bin 40CB and thereby taken into the machine. A user can prevent recirculation of the counterfeit money by arbitrarily collecting the counterfeit money taken into the machine. Also, according to the coin depositing and dispensing machine 1, there is no need to provide a capture bin 40CB dedicated for counterfeit money, preventing an increase in size of the machine. Furthermore, the coin depositing and dispensing machine 1 can be provided by upgrading a depositing/dispensing handling program without changing a hardware configuration of an existing coin depositing and dispensing machine.

[0081] Therefore, the coin depositing and dispensing machine 1 can flexibly respond to regulations on handling of counterfeit money such as the ECB regulation (including regulations set by respective providers of the machines). Furthermore, the first mode is automatically switched to the second mode, and thus, a user can perform a depositing/dispensing operation as usual without particularly being aware of counterfeit money being taken into the machine.

[0082] Also, in dispensing handling in the first mode, feeding of coins from all the storing/feeding units 40 are permitted, and in dispensing handling in the second mode, feeding of coins from the storing/feeding unit 40 allocated for counterfeit money storage (capture bin 40CB) is prohibited, enabling reliable prevention of counterfeit money recirculation.

[A non limiting example]

[0083] A coin depositing and dispensing machine 2 according to a non limiting example has a hardware configuration that is similar to that of the first embodiment. The coin depositing and dispensing machine 2 according to the non limiting example is different from that of the first embodiment in installed depositing/dispensing handling program.

[0084] In the non limiting example when coin depositing and dispensing machine 2 is started up, a depositing/dispensing mode is set to "first mode" in advance and the controller 30 performs normal depositing/dispensing handling in the first mode. And when the recognition unit 32 detects counterfeit money, the depositing/dispensing mode is manually switched from the first mode to a second mode according to an operation rule by the provider of the machine, and depositing/dispensing handling is performed in the second mode until collection of the counterfeit money. Also, at the time of coin collection, the depositing/dispensing mode is switched to a collection mode.

[0085] FIG. 6 is a flowchart illustrating an example of depositing/dispensing handling according to the non limiting example. This handling is performed, for example, upon a CPU 101 executing a depositing/dispensing handling program stored in a storage unit 120 along with power-on of the coin depositing and dispensing machine 2. Detailed description of handling that is similar to that in the depositing/dispensing in the first embodiment (flowchart in FIG. 5) will be omitted.

[0086] As illustrated in FIG. 6, in step S201, a control unit 100 acquires a result of a deposited coin by the recognition unit 32.

[0087] In step S202, the control unit 100 determines whether or not the deposited coin is counterfeit money. If the deposited coin is counterfeit money ("YES" in step S202), the processing transitions to the processing in step S203. If the deposited coin is not counterfeit money ("NO" in step S202), that is, the deposited coin is genuine money regardless of whether the deposited coin is fit money or unfit money, the processing transitions to the processing in step S212.

[0088] In step S203, the control unit 100 determines whether or not the current depositing/dispensing mode is the first mode. If the current depositing/dispensing mode is the first mode ("YES" in step S203), the processing transitions to the processing in step S204. If the current depositing/dispensing mode is the second mode ("NO" in step S203), that is, if the capture bin 40CB has already been set, the processing transitions to the processing in step S211.

[0089] In step S204, the control unit 100 controls operation of a deposited money transport unit 30 to stop deposited coin transport. The deposited counterfeit money is held between the recognition unit 32 and a denomination-based sorting unit 33 disposed at a most upstream position of the deposited money transport unit 30 in a coin transport direction.

[0090] In step S205, the control unit 100 causes an operation/display unit 110 to display a mode switching approval screen. The mode switching approval screen, for example, indicates that counterfeit money has been detected and displays an approval button for confirming whether or not a user approves a shift from the first mode to the second mode.

[0091] In step S206, the control unit 100 receives an approval or a disapproval given by the user via the operation/display unit 110.

[0092] In step S207, the control unit 100 determines whether or not a shift to the second mode has been approved by the user. If the shift to the second mode has been approved ("YES" in step S207), the processing transitions to the processing in step S208. If the shift to the second mode has been disapproved ("NO" in step S207), the control unit 100 resumes the coin transport still in the first mode, to transport the coin determined as counterfeit money to a coin dispensing unit 60 and return the coin (step S213).

[0093] In step S208, the control unit 100 switches a flag indicating the depositing/dispensing mode from the first mode to the second mode.

[0094] In step S209, the control unit 100 determines a capture bin 40CB to be allocated for counterfeit money storage from among a plurality of storing/feeding units 40, based on a predetermined condition. The capture bin 40CB is set in a manner that is similar to that in the first embodiment.

[0095] In step S210, the control unit 100 notifies the user of the switching of the depositing/dispensing mode to the second mode and counterfeit money being taken in.

[0096] In step S211, the control unit 100 controls the operation of the deposited money transport unit 30 (denomination-based sorting units 33) according to the second mode to resume the coin transport and thereby transport the counterfeit money to the capture bin 40CB. Consequently, the counterfeit money is not returned and is taken into the machine. The counterfeit money taken into the machine is arbitrarily collected, enabling prevention of recirculation of the counterfeit money. In principle, counterfeit money is not included in the amount of deposited money, but may be included in the amount of deposited money in exceptional cases such as a case where the denomination of the counterfeit money is low.

[0097] In step S212, the control unit 100 controls the operation of the deposited money transport unit 30 (denomination-based sorting units 33) to transport the deposited coin to a relevant one of the storing/feeding units 40 allocated for respective denominations or the capture bin 40CB. More specifically, if a deposited coin that is genuine money is received in the first mode and the second mode ("NO" in step S202), the deposited coin is transported to a relevant one of the storing/feeding units 40 allocated for the respective denominations. The denomination allocated in the first mode is still allocated to the storing/feeding unit 40 set as the capture bin 40CB in the second mode. If genuine money is received in the second mode, genuine money may still be stored even to the storing/feeding unit 40 set as the capture bin 40CB. However, this does not apply to the case where the capture bin 40CB is set based on the sixth condition. Also, if counterfeit money is received in the second mode ("NO" in step S202), the counterfeit money is transported to the storing/feeding unit 40 set as the capture bin 40CB.

[0098] Here, if the deposited coin is unfit money, the deposited coin may be transported to the storing/feeding unit 40 allocated for the denomination of the deposited coin or may be returned to the coin dispensing unit 60.

[0099] As in the first embodiment, the counterfeit money stored in the capture bin 40CB is arbitrarily collected.

[0100] As described above, as in the first embodiment, the coin depositing and dispensing machine 2 (money handling machine) according to the non limiting example includes: the coin receiving unit 10 (money receiving unit) that receives money from the outside of the machine; the deposited money transport unit 30 (transport unit) that transports the money deposited from the money receiv-

ing unit 10; a recognition unit 32 that recognizes a denomination and authenticity of the money transported by the deposited money transport unit 30; the plurality of storing/feeding units 40 capable of storing the money and feeding the stored money; the coin dispensing unit 60 (money dispensing unit) that dispenses the money fed from the storing/feeding units 40; and the control unit 100 that controls storing of money in the plurality of storing/feeding units 40 and feeding of money from the plurality of storing/feeding units 40. A first mode and a second mode are set for selectable depositing/dispensing modes, in the first mode, the plurality of storing/feeding units (40) are allocated for respective denominations, and in the second mode, at least one of the plurality of storing/feeding units is allocated for counterfeit money storage. The control unit 100 controls the storing and the feeding of money according to a mode selected from the first mode and the second mode.

[0101] Also, the coin depositing and dispensing machine 2 further includes the operation/display unit 110 (a notification unit and an input unit) that provides a notification that the recognition unit 32 has detected counterfeit money and receives an instruction to select the first mode or the second mode. The control unit 100 makes switching from the first mode to the second mode based on an input from the operation/display unit 110, which serves as the input unit.

[0102] According to the coin depositing and dispensing machine 2, upon detection of counterfeit money and approval of a shift from the first mode to the second mode, the counterfeit money is stored in the capture bin 40CB and thereby taken into the machine. A user arbitrarily collects the counterfeit money taken into the machine, enabling prevention of recirculation of the counterfeit money. Also, the coin depositing and dispensing machine 2 eliminates the need for providing a dedicated capture bin 40CB for counterfeit money and this prevents an increase in size of the machine. Furthermore, the coin depositing and dispensing machine 2 can be provided by upgrading a depositing/dispensing handling program without changing a hardware configuration of an existing coin depositing and dispensing machine.

[0103] Therefore, the coin depositing and dispensing machine 2 can flexibly respond to regulations on handling of counterfeit money such as the ECB regulation (including regulations set by respective providers of the machines). Furthermore, if there is no strict regulation on handling of counterfeit money like the ECB regulation, operations according to respective providers of the machines are possible. For example, an operation in which counterfeit money of a low denomination is returned and counterfeit money of a high denomination is taken into the machine is possible.

[0104] In another non limiting example similar to the above embodiment of the invention and the non limiting example, although the above embodiment and non limiting example have been described in terms of the case where the control unit 100 permits feeding of coins from all of the storing/feeding units 40 in the first mode and prohibits feeding of coins from the storing/feeding unit 40 (capture bin 40CB) allocated for counterfeit money storage in dispensing handling in the second mode, feeding of coins from the capture bin 40CB may be permitted if a predetermined condition is met in dispensing handling in the second mode. The predetermined condition is, for example, that prevention of feeding of counterfeit money from the capture bin 40CB is ensured. The storing/feeding units 40 are each configured so as to feed coins in the order the coins are stored, and may permit feeding of coins from the storing/feeding unit 40 (capture bin 40CB) if genuine money has already been stored before detection of counterfeit money to the extent that genuine money stored before the detection of counterfeit money is fed out. Consequently, in the second mode, even if counterfeit money is not collected immediately after storing of the counterfeit money in the capture bin 40C, the operation can be continued as it is for some time, enabling prevention in a decrease in operational efficiency. In this case, also, in order to prevent a decrease in operational efficiency, it is preferable that the counterfeit money stored in the capture bin 40CB be collected early and the depositing/dispensing mode be returned to the first mode.

[0105] The present invention are not limited to the coin depositing and dispensing machine 1 described in the embodiment and is applicable also to, for example, a coin depositing and dispensing machine 3 having the inner structure illustrated in FIGS. 7A and 7B. FIG. 7A is a side view schematically illustrating a depositing/dispensing path in the coin depositing and dispensing machine 3, and FIG. 7B is a flat view schematically illustrating a dispensing path in the coin depositing and dispensing machine 3.

[0106] More specifically, the coin depositing and dispensing machine 3 illustrated in FIGS. 7A and 7B includes: a coin receiving unit 10 disposed at an upper portion of the machine; a deposited money transport unit 30 disposed below the coin receiving unit 10, the deposited money transport unit 30 including a recognition unit 32 and a denomination-based sorting unit 33; a dispensed money transport unit 50 disposed below the deposited money transport unit 30, the dispensed money transport unit 50 extending linearly; and storing/feeding units 40, four of which are arranged on each of opposite sides along a direction in which the dispensed money transport unit 50 extends. Each of the storing/feeding units 40 is a coin storing/feeding unit having a horizontally-disposed rotary disk. In such coin depositing and dispensing machine 3, depositing/dispensing handling is performed in a manner that is substantially similar to those in the embodiment.

[0107] Furthermore, the present invention is applicable not only to a coin depositing and dispensing machine but also to a banknote depositing and dispensing machine that performs banknote depositing/dispensing handling. A banknote depositing/dispensing handling machine

has, for example, the configuration disclosed in Japanese Patent Application Laid-Open No. 2012-203666. The present invention can be provided by upgrading a depositing/dispensing handling program in a known banknote depositing and dispensing machine, and thus, description of a detailed configuration of the banknote depositing/dispensing handling machine will be omitted. Also, the present invention is applicable not only to a depositing and dispensing machine that handles coins or banknotes, but also to an automatic change dispenser or a money changer.

[0108] The embodiments disclosed herein should be considered mere examples and not restrictive at all points. The scope of the present invention is defined not by the above description, but by the appended claims, and is intended to include all of alterations that are equivalent in meaning and range to the appended claims.

Reference Signs List

[0109]

1, 2, 3 coin depositing and dispensing machine (money handling machine)
10 coin receiving unit (money receiving unit)
20 retaining/feeding unit
21 centrifugal disk
22 cover member
23 coin retaining space
30 deposited money transport unit (transport unit)
31 transport belt
32 recognition unit
33 denomination-based sorting unit
34 rejected money sorting unit
35 tracking sensor
36 chute
37 drive motor
40 storing/feeding unit
40CB capture bin
41 centrifugal disk
42 cover member
43 coin storing space
50 dispensed money transport unit
51 transport belt
60 coin dispensing unit (money dispensing unit)
70 collection box (auxiliary storage unit)
100 control unit
110 operation/display unit (notification unit, input unit)
120 storage unit
C casing

Claims

1. A money handling machine comprising:

a money receiving unit (10) configured to receive money from outside of the money handling machine;
a transport unit (30) configured to transport the money received from outside of the money handling machine by the money receiving unit;
a recognition unit (32) configured to recognize a denomination and authenticity of the money transported by the transport unit;
a plurality of storing/feeding units (40) configured to store the money recognized by the recognition unit (32) and to feed the stored money;
a money dispensing unit (60) configured to dispense the stored money fed from the storing/feeding units (40); and
a control unit (100) configured to control the storing/feeding units (40) such that the storing/feeding units (40) store the money recognized by the recognition unit (32) in the storing/feeding units (40) and feed the stored money from the storing/feeding units (40), **characterized in that**
the money handling machine being provided with a depositing/dispensing mode being selected from a first mode and a second mode, the depositing/dispensing mode which is set to the first mode when the money handling machine is started up,
wherein when counterfeit money is recognized by the recognition unit (32), the control unit (100) is configured to switch the depositing/dispensing mode from the first mode to the second mode and to control the storing/feeding units (40) so as to store the counterfeit money recognized by the recognition unit (32) in the storing/feeding units (40) allocated for the counterfeit money storage,
wherein the control unit (100) is configured to switch the depositing/dispensing mode to a collection mode in collection processing,
wherein in the first mode, the storing/feeding units (40) are allocated for respective denominations and the control unit (100) is configured to permit feeding of the stored money from all of the storing/feeding units (40), and
in the second mode, at least one of the storing/feeding units (40) is allocated for counterfeit money storage and the control unit (100) is configured to prohibit feeding of the stored counterfeit money from the storing/feeding unit (40) allocated for the counterfeit money storage at least during dispensing processing,
wherein in the collection processing at a predetermined timing, the control unit (100) is configured to control the storing/feeding units (40) so as to sequentially feed out all of money stored in the storing/feeding unit (40) allocated for counterfeit money storage, the money including the counterfeit money, and to either transport the money to the money dispending unit (60) or

to transport the money to a detachable auxiliary storage unit (70), and
wherein upon receipt of an end of collection handling, the control unit (100) is configured to switch the collection mode to the depositing/dispending mode and to switch the depositing/dispensing mode from the second mode to the first mode provided that no money is stored in the storing/feeding unit (40) allocated for counterfeit money storage.

2. The money handling machine according to claim 1, wherein, in the second mode, the control unit (100) is configured to determine a first storing/feeding unit allocated for the counterfeit money storage among the storing/feeding units (40), based on a predetermined condition.

3. The money handling machine according to claim 2, wherein the predetermined condition includes a first condition on denominations for which the storing/feeding units (40) had been allocated in the first mode, wherein a storing/feeding unit which stores a largest denomination of money in the second mode is set as the first storing/feeding unit.

4. The money handling machine according to claim 2, wherein the predetermined condition includes a second condition on a number of pieces of the money stored in the storing/feeding unit (40).

5. The money handling machine according to claim 2, wherein the predetermined condition includes a third condition on a location of the storing/feeding unit (40).

6. The money handling machine according to claim 2, wherein the predetermined condition includes a fourth condition on a number of the storing/feeding units (40) allocated for a same denomination, and wherein one of plurality of storing/feeding units (40) allocated for the same denomination is set as the first storing/feeding unit.

7. The money handling machine according to claim 1, wherein, when the control unit (100) is configured to switch the depositing/dispensing mode from the first mode to the second mode, the control unit (100) is configured to cause genuine money stored in the storing/feeding unit (40) allocated for the counterfeit money storage to be fed out.

8. The money handling machine according to claim 1, wherein:
the storing/feeding units (40) are each configured so as to feed pieces of money in an order the pieces of money are stored; and if genuine money has already been stored in the storing/feeding unit (40) allocated for the counterfeit money storage before detection of the counterfeit money in the second mode, the control unit (100) is configured to permit feeding of the money from the storing/feeding unit (40) to an extent that the genuine money already stored in the storing/feeding unit (40) allocated for the counterfeit money storage is fed out.

9. The money handling machine according to any one of claims 1 to 8, wherein:
the money is comprised of coins.

Patentansprüche

1. Geldhandhabungsmaschine, umfassend:

eine Geldannahmeeinheit (10), die dazu eingerichtet ist, Geld von außerhalb der Geldhandhabungsmaschine entgegenzunehmen;
eine Transporteinheit (30), die dazu eingerichtet ist, das Geld zu transportieren, das von der Geldannahmeeinheit von außerhalb der Geldhandhabungsmaschine entgegengenommen wurde;
eine Erkennungseinheit (32), die dazu eingerichtet ist, einen Nennwert und eine Echtheit des von der Transporteinheit transportierten Geldes zu erkennen;
eine Vielzahl von Speicher-/Zuführeinheiten (40), die dazu eingerichtet sind, das von der Erkennungseinheit (32) erkannte Geld zu speichern und das gespeicherte Geld zuzuführen;
eine Geldauszahlungseinheit (60), die dazu eingerichtet ist, das von den Speicher-/Zuführeinheiten (40) zugeführte gespeicherte Geld auszuzahlen; und
eine Steuereinheit (100), die dazu eingerichtet ist, die Speicher-/Zuführeinheiten (40) derart zu steuern, dass die Speicher-/Zuführeinheiten (40) das von der Erkennungseinheit (32) erkannte Geld in den Speicher-/Zuführeinheiten (40) speichern und das gespeicherte Geld von den Speicher-/Zuführeinheiten (40) zuführen,
dadurch gekennzeichnet, dass
die Geldhandhabungsmaschine mit einem Einzahlungs-/Auszahlungsmodus versehen ist, der aus einem ersten Modus und einem zweiten Modus ausgewählt wird, wobei der Einzahlungs-/Auszahlungsmodus auf den ersten Modus eingestellt ist, wenn die Geldhandhabungsmaschine eingeschaltet wird,
wobei die Steuereinheit (100) für den Fall, dass von der Erkennungseinheit (32) Falschgeld erkannt wird, dazu eingerichtet ist, den Einzahlungs-/Auszahlungsmodus vom ersten Modus auf den zweiten Modus umzuschalten und die Speicher-/Zuführeinheiten (40) zu steuern, um das von der Erkennungseinheit (32) erkannte

Falschgeld in den für das Speichern von Falschgeld reservierten Speicher-/Zuführeinheiten (40) zu speichern,
wobei die Steuereinheit (100) dazu eingerichtet ist, den Einzahlungs-/Auszahlungsmodus bei einer Sammelverarbeitung auf einen Sammelmodus zu schalten,
wobei die Speicher-/Zuführeinheiten (40) im ersten Modus für jeweilige Nennwerte reserviert sind und die Steuereinheit (100) dazu eingerichtet ist, das Zuführen des gespeicherten Geldes von allen Speicher-/Zuführeinheiten (40) zuzulassen, und
im zweiten Modus mindestens eine der Speicher-/Zuführeinheiten (40) für das Speichern von Falschgeld reserviert ist und die Steuereinheit (100) dazu eingerichtet ist, das Zuführen des gespeicherten Falschgelds von der für das Speichern von Falschgeld reservierten Speicher-/Zuführeinheit (40) zumindest während der Auszahlungsverarbeitung zu unterbinden,
wobei die Steuereinheit (100) bei der Sammelverarbeitung mit einem vorgegebenen zeitlichen Ablauf dazu eingerichtet ist, die Speicher-/Zuführeinheiten (40) zu steuern, um das gesamte in der für das Speichern von Falschgeld reservierten Speicher-/Zuführeinheit (40) gespeicherte Geld, wobei das Geld das Falschgeld umfasst, der Reihe nach herauszuführen und das Geld entweder zur Geldauszahlungseinheit (60) zu transportieren oder das Geld zu einer lösbaren Hilfsspeichereinheit (70) zu transportieren, und
wobei die Steuereinheit (100) dazu eingerichtet ist, nach Empfang eines Endes der Sammelhandhabung den Sammelmodus auf den Einzahlungs-/Auszahlungsmodus umzuschalten und den Einzahlungs-/Auszahlungsmodus vom zweiten Modus auf den ersten Modus umzuschalten, sofern kein Geld in der Speicher-/Zuführeinheit (40) gespeichert ist, die für das Speichern von Falschgeld reserviert ist.

2. Geldhandhabungsmaschine nach Anspruch 1, wobei die Steuereinheit (100) im zweiten Modus dazu eingerichtet ist, eine erste Speicher-/Zuführeinheit, die für das Speichern von Falschgeld reserviert ist, auf der Grundlage einer vorgegebenen Bedingung unter den Speicher-/Zuführeinheiten (40) zu bestimmen.

3. Geldhandhabungsmaschine nach Anspruch 2, wobei die vorgegebene Bedingung eine erste Bedingung in Bezug auf Nennwerte umfasst, für die die Speicher-/Zuführeinheiten (40) im ersten Modus reserviert wurden, wobei eine Speicher-/Zuführeinheit, die einen höchsten Geldnennwert speichert, im zweiten Modus als die erste Speicher-/Zuführeinheit festgelegt ist.

4. Geldhandhabungsmaschine nach Anspruch 2, wobei die vorgegebene Bedingung eine zweite Bedingung in Bezug auf eine Anzahl von Stücken des in der Speicher-/Zuführeinheit (40) gespeicherten Gelds umfasst.

5. Geldhandhabungsmaschine nach Anspruch 2, wobei die vorgegebene Bedingung eine dritte Bedingung in Bezug auf einen Ort der Speicher-/Zuführeinheit (40) umfasst.

6. Geldhandhabungsmaschine nach Anspruch 2, wobei die vorgegebene Bedingung eine vierte Bedingung in Bezug auf eine Anzahl der Speicher-/Zuführeinheiten (40) umfasst, die für einen selben Nennwert reserviert sind, und wobei eine der Vielzahl von Speicher-/Zuführeinheiten (40), die für denselben Nennwert reserviert sind, als die erste Speicher-/Zuführeinheit festgelegt ist.

7. Geldhandhabungsmaschine nach Anspruch 1, wobei die Steuereinheit (100) für den Fall, dass die Steuereinheit (100) dazu eingerichtet ist, den Einzahlungs-/Auszahlungsmodus vom ersten Modus auf den zweiten Modus umzuschalten, dazu eingerichtet ist, zu veranlassen, dass in der für das Speichern von Falschgeld reservierten Speicher-/Zuführeinheit (40) gespeichertes echtes Geld herausgeführt wird.

8. Geldhandhabungsmaschine nach Anspruch 1, wobei:
die Speicher-/Zuführeinheiten (40) jeweils dazu eingerichtet sind, Geldstücke in einer Reihenfolge zuzuführen, in der die Geldstücke gespeichert werden; und die Steuereinheit (100) für den Fall, dass bereits echtes Geld in der für das Speichern von Falschgeld reservierten Speicher-/Zuführeinheit (40) vor dem Erkennen des Falschgelds im zweiten Modus gespeichert wurde, dazu eingerichtet ist, das Zuführen des Geldes von der Speicher-/Zuführeinheit (40) derart zuzulassen, dass das bereits in der für das Speichern von Falschgeld reservierten Speicher-/Zuführeinheit (40) gespeicherte echte Geld herausgeführt wird.

9. Geldhandhabungsmaschine nach einem der Ansprüche 1 bis 8, wobei:
das Geld aus Münzen besteht.

Revendications

1. Machine de manipulation d'argent comprenant :

une unité de réception d'argent (10) conçue pour

recevoir de l'argent depuis l'extérieur de la machine de manipulation d'argent ;
une unité de transport (30) conçue pour transporter l'argent reçu depuis l'extérieur de la machine de manipulation d'argent par l'unité de réception d'argent ;
une unité de reconnaissance (32) conçue pour reconnaître une valeur et l'authenticité de l'argent transporté par l'unité de transport ;
une pluralité d'unités de stockage/alimentation (40) conçues pour stocker l'argent reconnu par l'unité de reconnaissance (32) et pour alimenter l'argent stocké ;
une unité de distribution d'argent (60) conçue pour distribuer l'argent stocké alimenté depuis les unités de stockage/alimentation (40) ; et
une unité de commande (100) conçue pour commander les unités de stockage/alimentation (40) de telle sorte que les unités de stockage/alimentation (40) stockent l'argent reconnu par l'unité de reconnaissance (32) dans les unités de stockage/alimentation (40) et alimentent l'argent stocké depuis les unités de stockage/alimentation (40), **caractérisée en ce que**
la machine de manipulation d'argent est pourvue d'un mode de dépôt/distribution qui est sélectionné parmi un premier mode et un deuxième mode, le mode de dépôt/distribution étant réglé sur le premier mode lorsque la machine de manipulation d'argent est démarrée,
où, lorsque de l'argent contrefait est reconnu par l'unité de reconnaissance (32), l'unité de commande (100) est conçue pour commuter le mode de dépôt/distribution du premier mode dans le deuxième mode et pour commander les unités de stockage/alimentation (40) de façon à stocker l'argent contrefait reconnu par l'unité de reconnaissance (32) dans les unités de stockage/alimentation (40) attribuées au stockage d'argent contrefait,
l'unité de commande (100) étant conçue pour commuter le mode de dépôt/distribution dans un mode de collecte dans un traitement de collecte,
où, dans le premier mode, les unités de stockage/alimentation (40) sont attribuées aux valeurs respectives et l'unité de commande (100) est conçue pour permettre l'alimentation de l'argent stocké à partir de toutes les unités de stockage/alimentation (40) et
dans le deuxième mode, au moins l'une des unités de stockage/alimentation (40) est attribuée au stockage d'argent contrefait et l'unité de commande (100) est conçue pour empêcher l'alimentation de l'argent contrefait stocké depuis l'unité de stockage/alimentation (40) attribuée au stockage d'argent contrefait au moins pendant le traitement de distribution,
où, dans le traitement de collecte à un moment prédéterminé, l'unité de commande (100) est conçue pour commander les unités de stockage/alimentation (40) de façon à distribuer séquentiellement tout l'argent stocké dans l'unité de stockage/alimentation (40) attribuée au stockage d'argent contrefait, l'argent comprenant l'argent contrefait et soit pour transporter l'argent vers l'unité de distribution d'argent (60) soit pour transporter l'argent vers une unité de stockage auxiliaire détachable (70) et
où, lors de la réception d'une fin de manipulation de collecte, l'unité de commande (100) est conçue pour commuter le mode de collecte dans le mode de dépôt/distribution et pour commuter le mode de dépôt/distribution du deuxième mode dans le premier mode à condition qu'aucun argent n'est stocké dans l'unité de stockage/alimentation (40) attribuée au stockage d'argent contrefait.

2. Machine de manipulation d'argent selon la revendication 1, où, dans le deuxième mode, l'unité de commande (100) est conçue pour déterminer une première unité de stockage/alimentation attribuée au stockage d'argent contrefait parmi les unités de stockage/alimentation (40), sur la base d'une condition prédéterminée.

3. Machine de manipulation d'argent selon la revendication 2, la condition prédéterminée comprenant une première condition sur des valeurs auxquelles les unités de stockage/alimentation (40) ont été attribuées dans le premier mode, une unité de stockage/alimentation qui stocke une plus grande valeur d'argent dans le deuxième mode étant définie en tant que première unité de stockage/alimentation.

4. Machine de manipulation d'argent selon la revendication 2, la condition prédéterminée comprenant une deuxième condition sur un certain nombre de pièces d'argent stocké dans l'unité de stockage/alimentation (40).

5. Machine de manipulation d'argent selon la revendication 2, la condition prédéterminée comprenant une troisième condition sur un emplacement de l'unité de stockage/alimentation (40).

6. Machine de manipulation d'argent selon la revendication 2, la condition prédéterminée comprenant une quatrième condition sur un certain nombre des unités de stockage/alimentation (40) attribuées à une même valeur et une unité parmi une pluralité d'unités de stockage/alimentation (40) attribuées à la même valeur étant définie en tant que première unité de stockage/alimentation.

7. Machine de manipulation d'argent selon la revendication 1, où, lorsque l'unité de commande (100) est conçue pour commuter le mode de dépôt/distribution du premier mode dans le deuxième mode, l'unité de commande (100) est conçue pour provoquer la distribution de l'argent authentique stocké dans l'unité de stockage/alimentation (40) attribuée au stockage d'argent contrefait.

8. Machine de manipulation d'argent selon la revendication 1 :
les unités de stockage/alimentation (40) étant toutes conçues de façon à alimenter des pièces d'argent dans l'ordre dans lequel les pièces d'argent sont stockées ; et si de l'argent authentique a déjà été stocké dans l'unité de stockage/alimentation (40) attribuée au stockage d'argent contrefait avant la détection de l'argent contrefait dans le deuxième mode, l'unité de commande (100) est conçue pour permettre l'alimentation de l'argent depuis l'unité de stockage/alimentation (40) dans une mesure telle que l'argent authentique déjà stocké dans l'unité de stockage/alimentation (40) attribuée au stockage d'argent contrefait est distribué.

9. Machine de manipulation d'argent selon l'une quelconque des revendications 1 à 8 :
l'argent étant constitué de monnaie.

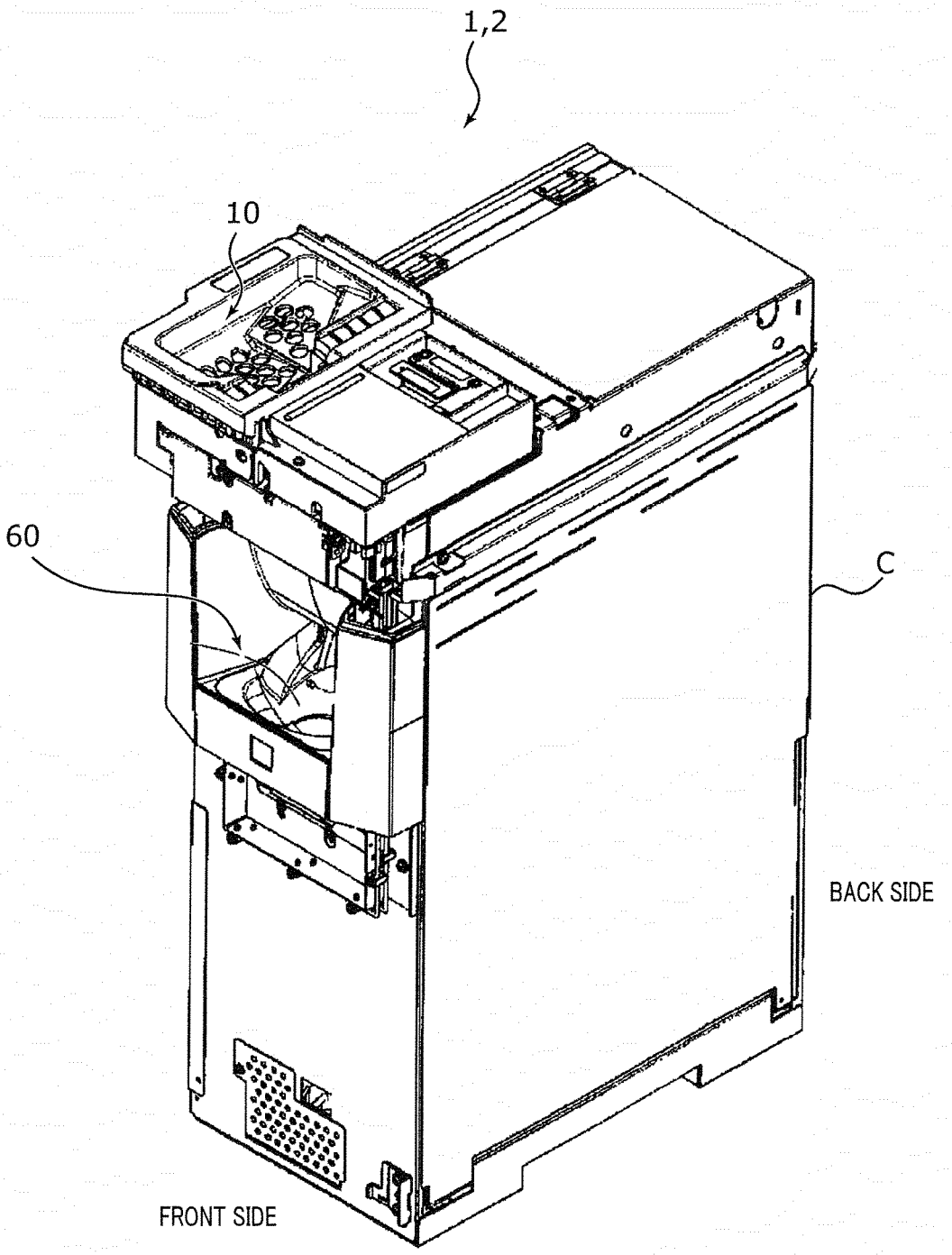

FIG. 1

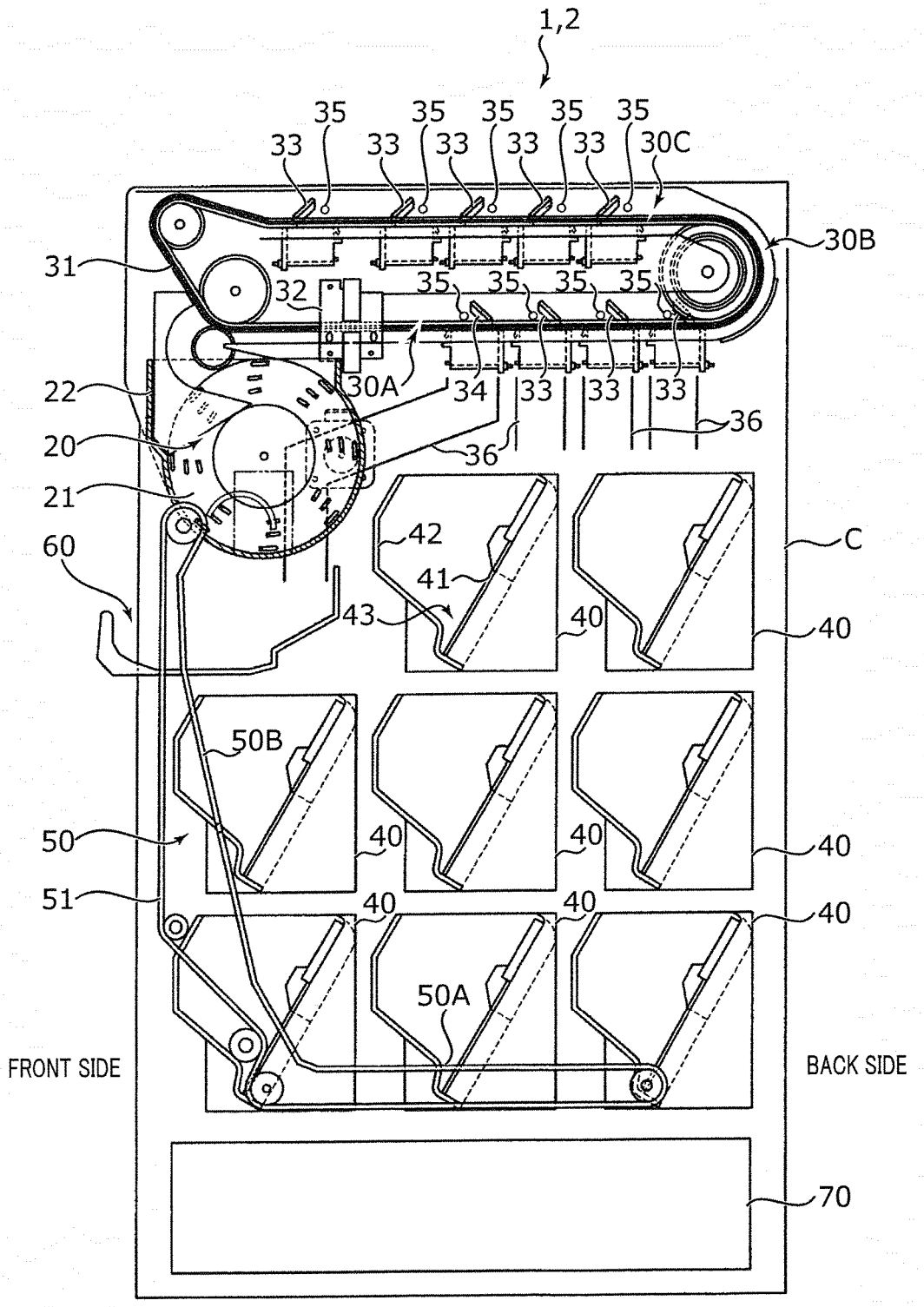
1,2
35
33
30C
30B
31
32
30A
34
36
22
20
21
60
42
41
43
40
C
50B
50
51
50A
FRONT SIDE
BACK SIDE
70

FIG. 2

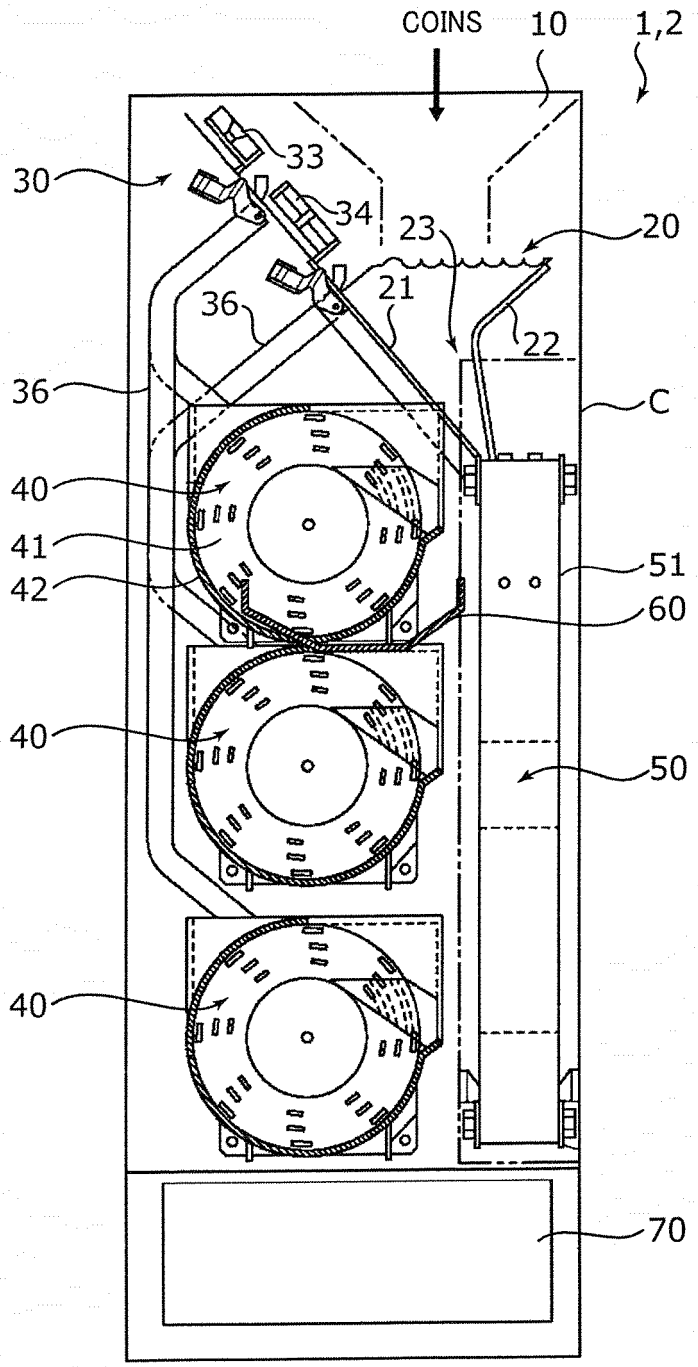

FIG. 3

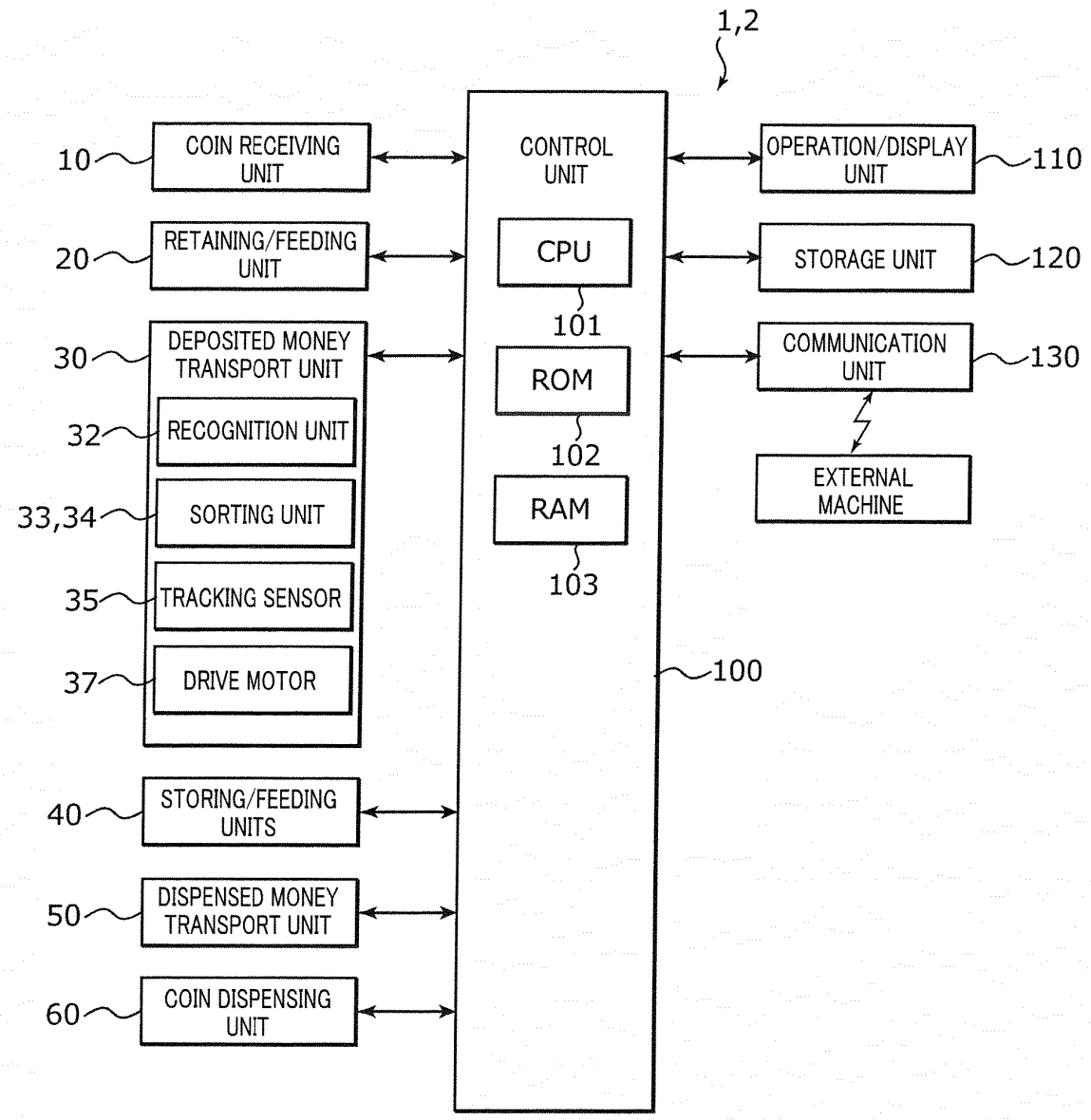
1,2
10
COIN RECEIVING UNIT
20
RETAINING/FEEDING UNIT
30
DEPOSITED MONEY TRANSPORT UNIT
32
RECOGNITION UNIT
33,34
SORTING UNIT
35
TRACKING SENSOR
37
DRIVE MOTOR
40
STORING/FEEDING UNITS
50
DISPENSED MONEY TRANSPORT UNIT
60
COIN DISPENSING UNIT
CONTROL UNIT
CPU
101
ROM
102
RAM
103
100
OPERATION/DISPLAY UNIT
110
STORAGE UNIT
120
COMMUNICATION UNIT
130
EXTERNAL MACHINE

FIG. 4

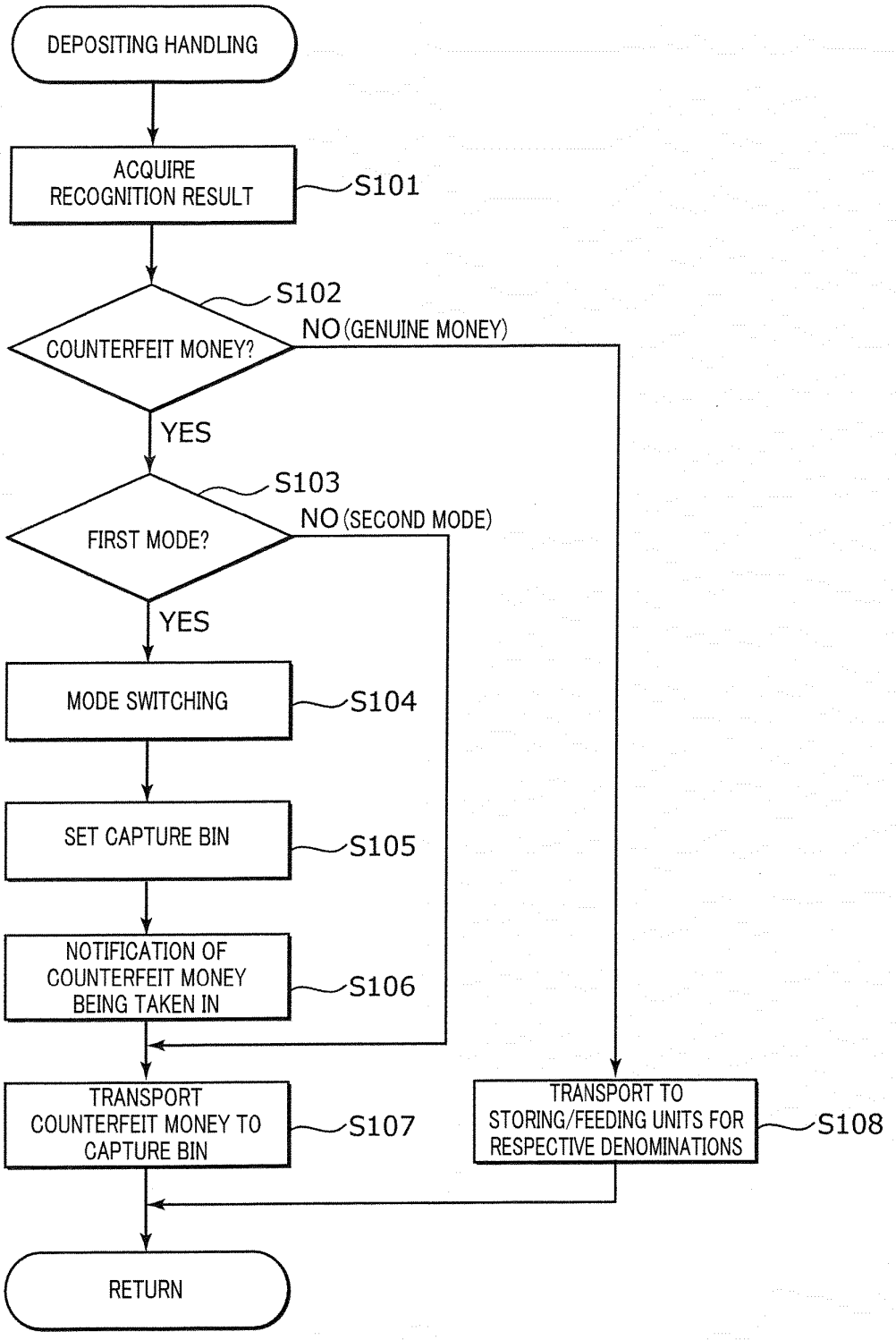
DEPOSITING HANDLING
ACQUIRE RECOGNITION RESULT
S101
S102
COUNTERFEIT MONEY?
NO (GENUINE MONEY)
YES
S103
FIRST MODE?
NO (SECOND MODE)
YES
MODE SWITCHING
S104
SET CAPTURE BIN
S105
NOTIFICATION OF COUNTERFEIT MONEY BEING TAKEN IN
S106
TRANSPORT COUNTERFEIT MONEY TO CAPTURE BIN
S107
TRANSPORT TO STORING/FEEDING UNITS FOR RESPECTIVE DENOMINATIONS
S108
RETURN

FIG. 5

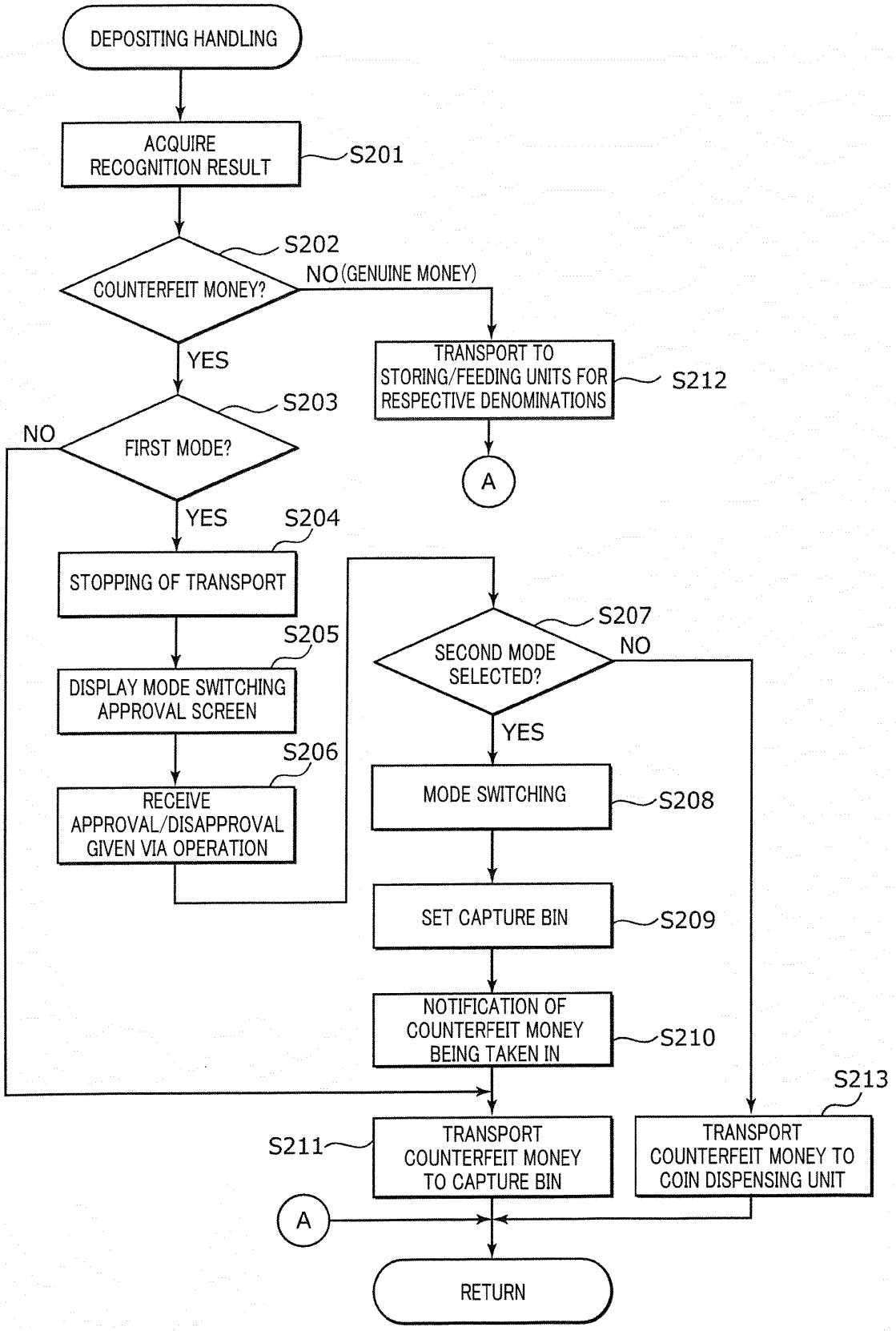
DEPOSITING HANDLING
ACQUIRE RECOGNITION RESULT
S201
S202
COUNTERFEIT MONEY?
NO (GENUINE MONEY)
YES
TRANSPORT TO STORING/FEEDING UNITS FOR RESPECTIVE DENOMINATIONS
S212
A
S203
NO
FIRST MODE?
YES
S204
STOPPING OF TRANSPORT
S205
DISPLAY MODE SWITCHING APPROVAL SCREEN
S206
RECEIVE APPROVAL/DISAPPROVAL GIVEN VIA OPERATION
S207
SECOND MODE SELECTED?
NO
YES
MODE SWITCHING
S208
SET CAPTURE BIN
S209
NOTIFICATION OF COUNTERFEIT MONEY BEING TAKEN IN
S210
S213
S211
TRANSPORT COUNTERFEIT MONEY TO CAPTURE BIN
TRANSPORT COUNTERFEIT MONEY TO COIN DISPENSING UNIT
A
RETURN

FIG. 6

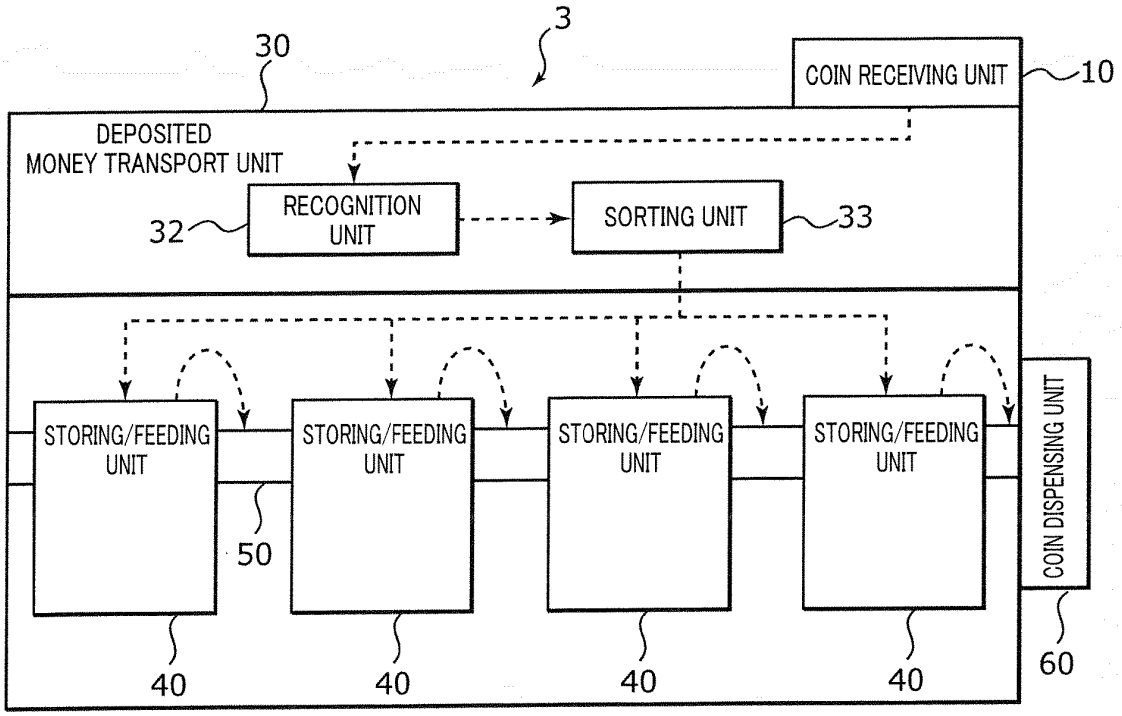
3
30
COIN RECEIVING UNIT
10
DEPOSITED
MONEY TRANSPORT UNIT
32
RECOGNITION
UNIT
SORTING UNIT
33
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
COIN DISPENSING UNIT
50
40
40
40
40
60

FIG. 7A

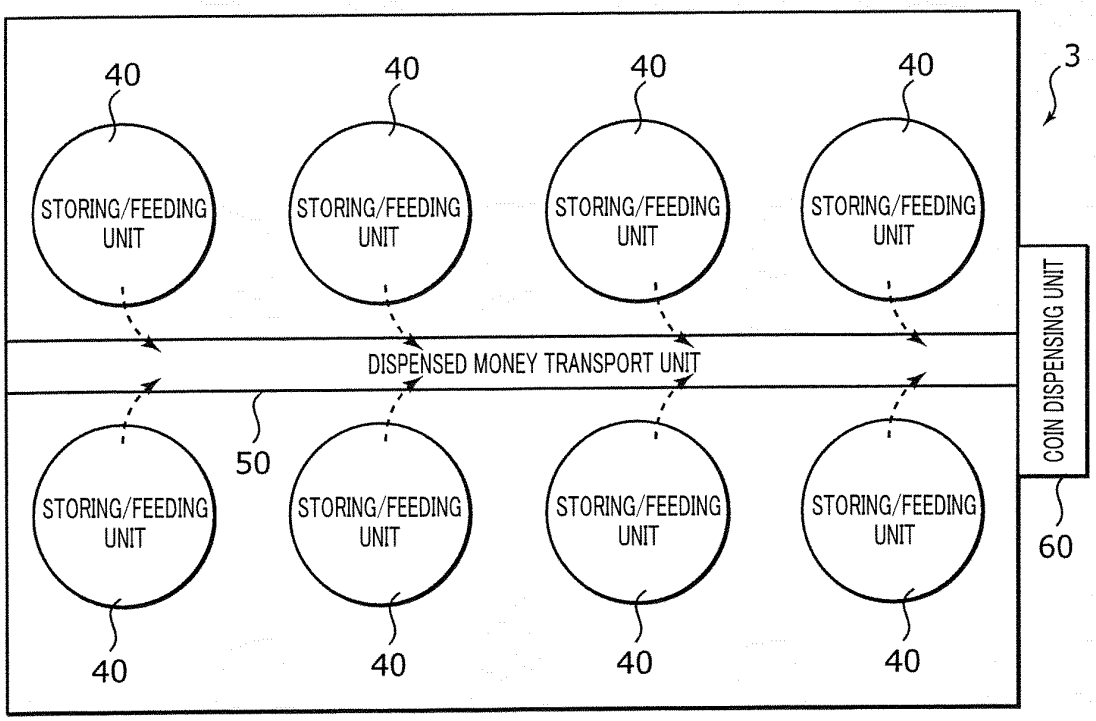
40
40
40
40
3
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
DISPENSED MONEY TRANSPORT UNIT
COIN DISPENSING UNIT
50
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
STORING/FEEDING
UNIT
60
40
40
40
40

FIG. 7B

REFERENCES CITED IN THE DESCRIPTION

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