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(54) **BANKNOTE HANDLING DEVICE AND BANKNOTE HANDLING METHOD**

BANKNOTENHANDHABUNGSVORRICHTUNG UND BANKNOTENHANDHABUNGSVERFAHREN
DISPOSITIF DE MANIPULATION DE BILLETS DE BANQUE ET PROCÉDÉ DE MANIPULATION DE
BILLETS DE BANQUE

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Description

TECHNICAL FIELD

[0001] The present invention relates to a banknote handling device for processing stock reconciliation of a banknote and a banknote handling method using the banknote handling device.

DESCRIPTION OF THE RELATED ART

[0002] Conventionally, a cash settlement device is used by store clerks to perform cash handover work with customers in a store checkout counter. The cash settlement device has a function of recognizing and counting inserted money, storing it after calculating the amount of money, and dispensing the stored money as a change. Furthermore, in a back office of the store, a cash teller device is installed to replenish money as a change fund in the above cash settlement device and to collect money as a sales proceeds from the cash settlement device. The cash teller device has a function of storing money collected from the cash settlement device and dispensing money to be replenished into the cash settlement device. As such cash settlement device and cash teller device, for example, one disclosed in Japanese Patent Laid-Open Publication No. 2013-8209 is conventionally known.

[0003] In a banknote handling system of the prior art as disclosed in Japanese Patent Laid-Open Publication No. 2013-8209, a cash delivering cassette is used for delivering banknotes between the cash settlement device provided in the checkout counter of the store and the cash teller device installed in the back office. Using the cash delivering cassette does not cause the hands of the operator to touch the banknotes when delivering the banknotes between the cash settlement device and the cash teller device. Therefore, it is possible to prevent occurrence of troubles such as the banknotes being stolen when delivering such the banknotes.

[0004] US 2013/001039 A1 discloses a banknote handling device with an upper and a lower unit. The lower unit comprises banknote storage units which store the banknotes by denomination. Stock reconciliation can be performed on the storage units in the lower unit.

[0005] WO 2010/064310 A1 discloses a banknote handling device which comprises storage units with adjustable regulating members. These regulating member define the space which is available for banknotes in the storage unit by moving in a horizontal direction, i.e. orthogonal to the stacking direction.

SUMMARY OF INVENTION

[0006] In the banknote handling system of the prior art as disclosed in Japanese Patent Laid-Open Publication No. 2013-8209, the banknotes are transported along their longitudinal (long edge) direction in each of the cash

settlement device and the cash teller device. This makes it possible to save the space by reducing a width of a housing in each of the cash settlement device and the cash teller device, and to make a recognition unit installed in the cash settlement device and the cash teller device inexpensive.

[0007] In recent years, as for the cash teller device installed in the back office, since the cash teller device of the type in which the banknotes are transported along their longitudinal direction reduces the amount of the banknotes to be stored, there is a tendency to use one in which the banknotes are transported in their short edge direction in order to increase the storage amount of the banknotes. However, if the banknotes are transported along the longitudinal direction in the cash settlement device provided in the checkout counter of the store while the banknotes are transported along the short edge direction in the cash teller device installed in the back office, it is necessary for the operator to take out the banknotes once from the cash delivering cassette in which the banknotes collected from the cash settlement device are stored and change the orientation of the banknotes before putting the banknotes in the cash teller device. In this case, there was a problem that it is not possible to deliver the banknotes between the cash settlement device and the cash teller device without the banknotes being touched by the operator's hand.

[0008] The present invention has been made in view of the above matter, and an object of the present invention is to provide a banknote storage cassette, a banknote handling system and a banknote handling method capable of delivering the banknotes between a first banknote handling device in which the banknotes are transported along a first direction (for example, the longitudinal direction of the banknote) and a second banknote handling device in which the banknotes are transported along a second direction (for example, the short edge direction of the banknote) without the banknotes being touched by the operator's hand, and thereby improving the convenience for the operator and improving the anti-theft property.

[0009] A banknote storage cassette of the present invention includes: a storage unit that stores a banknote therein; a plurality of storage/feeding mechanisms for sending the banknote one by one from the outside of the storage unit to the inside to store the banknote in the storage unit and feeding out the banknote stored in the storage unit to the outside of the storage unit one by one; and feeding directions of the banknote by the storage/feeding mechanisms are different from each other.

[0010] In the banknote storage cassette according to the present invention, the plurality of storage/feeding mechanisms may include a first storage/feeding mechanism and a second storage/feeding mechanism that feeds the banknote in a direction substantially orthogonal to the feeding direction of the banknote by the first storage/feeding mechanism.

[0011] In this case, the banknotes may be stored in a

stacked state in the storage unit, and each of the first storage/feeding mechanism and the second storage/feeding mechanism may be provided at a position on the opposite side of the stacking direction of the banknote in the storage unit.

[0012] Furthermore, the stacking directions of the banknotes in the storage unit may be reversed between when the first storage/feeding mechanism is used and when the second storage/feeding mechanism is used.

[0013] Furthermore, a placement unit on which the banknote is placed may be provided between the first storage/feeding mechanism and the second storage/feeding mechanism, and a first storage/feeding space may be formed between the first storage/feeding mechanism and the placement unit and a second storage/feeding space is formed between the second storage/feeding mechanism and the placement unit.

[0014] In this case, the placement unit may include a first placement portion and a second placement portion, the banknote is capable of being stored in a space between the first storage/feeding mechanism and the first placement portion of the placement unit and fed out from the space therebetween, and the banknote is capable of being stored in a space between the second storage/feeding mechanism and the second placement portion of the placement unit and fed out from the space therebetween.

[0015] Furthermore, one of the first placement portion and the second placement portion may function as a placement plate on which the banknotes are placed in a stacked state and the other may function as a guide plate for guiding the banknote when the banknote is sent from the outside to the inside of the storage unit, a storage space for the banknote may be formed between the placement plate and the guide plate, and the functions of the placement plate and the guide plate may be interchanged when the stacking direction of the banknotes in the storage unit is reversed.

[0016] Furthermore, the banknote stored in the storage unit by one storage/feeding mechanism of the first storage/feeding mechanism and the second storage/feeding mechanism may be capable of being fed out to the outside of the storage unit by the other storage/feeding mechanism.

[0017] Furthermore, two gripping units for gripping the banknote storage cassette may be respectively provided at positions opposite to each other in the stacking direction of the banknotes in the storage unit.

[0018] Furthermore, two connectors for receiving electric power from an external device may be respectively provided at positions opposite to each other in the stacking direction of the banknotes in the storage unit.

[0019] Furthermore, in the first storage/feeding mechanism and the second storage/feeding mechanism, configurations of feeding members for feeding out the banknote stored in the storage unit one by one to the outside of the storage unit may be different from each other.

[0020] In this case, the storage/feeding mechanism for

feeding the banknote along a short edge direction thereof among the first storage/feeding mechanism and the second storage/feeding mechanism may be provided with a feeding roller as the feeding member, and the storage/feeding mechanism for feeding the banknote along a long edge direction thereof among the first storage/feeding mechanism and the second storage/feeding mechanism may be provided with a feeding belt as the feeding member.

[0021] The banknote storage cassette of the present invention may further include a memory unit for storing an order of the banknote stored in the storage unit and a serial number of the banknote in an associated state.

[0022] A banknote handling system of the present invention includes: a banknote storage cassette that includes a storage unit that stores a banknote therein, a plurality of storage/feeding mechanisms for sending the banknote one by one from the outside of the storage unit to the inside to store the banknote in the storage unit and feeding out the banknote stored in the storage unit to the outside of the storage unit one by one, and a memory unit for storing an order of the banknote stored in the storage unit and a serial number of the banknote in an associated state, feeding directions of the banknote by the storage/feeding mechanisms being different from each other; and a banknote handling device on which the banknote storage cassette is detachably mounted, in which the banknote is sent from a main body to the banknote storage cassette and stored in the storage unit of the banknote storage cassette, and in which the banknote fed out from the storage unit of the banknote storage cassette by the storage/feeding mechanism is sent to the main body; and the banknote handling device includes a reading unit that reads information stored in the memory unit of the banknote storage cassette mounted on the banknote handling device and a controlling unit that manages the serial number of the banknote sent from the banknote storage cassette to the main body of the banknote handling device based on the information read by the reading unit, and the controlling unit determines the order of the banknote sent from the banknote storage cassette to the main body of the banknote handling device based on a type of the storage/feeding mechanism used in the banknote storage cassette mounted on the banknote handling device.

[0023] A banknote handling system of the present invention includes: a banknote storage cassette that includes a storage unit that stores a banknote therein, and a plurality of storage/feeding mechanisms for sending the banknote one by one from the outside of the storage unit to the inside to store the banknote in the storage unit and feeding out the banknote stored in the storage unit to the outside of the storage unit one by one, feeding directions of the banknote by the storage/feeding mechanisms being different from each other; and a plurality of banknote handling devices on which the banknote storage cassette is detachably mounted, in which the banknote is sent from a main body to the banknote storage

cassette and stored in the storage unit of the banknote storage cassette, and in which the banknote fed out from the storage unit of the banknote storage cassette by the storage/feeding mechanism is sent to the main body; and transportation directions of the banknote in the banknote handling devices are different from each other, and when the banknote storage cassette is mounted on one certain banknote handling device, the banknote is sent along a first feeding direction in the banknote storage cassette, and when the banknote storage cassette is mounted on another banknote handling device, the banknote is sent along a second feeding direction different from the first feeding direction in the banknote storage cassette.

[0024] In the banknote handling system of the present invention, the plurality of banknote handling devices may include a first banknote handling device and a second banknote handling device in which the banknote is transported in a direction substantially orthogonal to the transportation direction of the banknote in the first banknote handling device, the plurality of storage/feeding mechanisms in the banknote storage cassette may include a first storage/feeding mechanism and a second storage/feeding mechanism that feeds the banknote in a direction substantially orthogonal to the feeding direction of the banknote by the first storage/feeding mechanism.

[0025] A banknote handling method of the present invention includes: mounting on a first banknote handling device a banknote storage cassette that includes a storage unit that stores a banknote therein, and a plurality of storage/feeding mechanisms for sending the banknote one by one from the outside of the storage unit to the inside to store the banknote in the storage unit and feeding out the banknote stored in the storage unit to the outside of the storage unit one by one, feeding directions of the banknote by the storage/feeding mechanisms being different from each other, to send the banknote from a main body of the first banknote handling device to the banknote storage cassette along a first feeding direction to store the banknote in the storage unit of the banknote storage cassette; and mounting the banknote storage cassette on a second banknote handling device that is different from the first banknote handling device to feed out the banknote stored in the storage unit of the banknote storage cassette one by one along a second feeding direction that is different from the first feeding direction to the outside of the storage unit to send the banknote to the main body of the second banknote handling device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

FIG. 1 is a block diagram illustrating a configuration example of a cash management system according to an embodiment of the present invention.

FIG. 2 is a perspective view showing an appearance of a cash settlement device provided in the cash management system shown in FIG. 1.

FIG. 3 is a configuration diagram schematically showing an internal configuration of a banknote settlement device in the cash settlement device shown in FIG. 2.

FIG. 4 is a functional block diagram showing a configuration of a control system of the cash settlement device shown in FIG. 2.

FIG. 5 is a configuration diagram schematically showing an internal configuration of a banknote teller device in a cash teller device provided in the cash management system shown in FIG. 1.

FIG. 6 is a functional block diagram showing a configuration of a control system of the cash teller device provided in the cash management system shown in FIG. 1.

FIG. 7 is a perspective view schematically showing a configuration of a banknote storage cassette for delivering banknotes between the banknote settlement device and the banknote teller device in the cash management system shown in FIG. 1.

FIG. 8 is a side view showing a state in which the banknotes are stored in the banknote storage cassette shown in FIG. 7 in the banknote settlement device.

FIG. 9 is a side view showing a state in which the banknote storage cassette has been removed from the banknote settlement device after the banknotes have been stored in the banknote storage cassette shown in FIG. 7 in the banknote settlement device.

FIG. 10 is a side view showing a state in which the banknotes are fed out from the banknote storage cassette shown in FIG. 7 in the banknote teller device.

FIG. 11 is a side view showing a state when the banknote storage cassette shown in FIG. 10 is viewed from the side.

FIG. 12 is a side view showing another configuration example of the banknote storage cassette according to the embodiment of the present invention.

FIG. 13 is a side view showing a state in which the banknote storage cassette shown in FIG. 12 stores the banknotes of relatively large size.

FIG. 14 is a side view showing a state in which the banknote storage cassette shown in FIG. 12 stores the banknotes of relatively small size.

FIG. 15 is a side view showing still another configuration example of the banknote storage cassette according to the embodiment of the present invention.

FIG. 16 is a side view showing still another configuration example of the banknote storage cassette according to the embodiment of the present invention.

FIG. 17 is a side view showing still another configuration example of the banknote storage cassette according to the embodiment of the present invention.

FIG. 18 is a side view showing an operation when the banknotes are stored in the banknote storage cassette shown in FIG. 17.

FIG. 19 is a side view showing an operation when

the banknotes are stored in the banknote storage cassette shown in FIG. 17.

FIG. 20 is a side view showing still another configuration example of the banknote storage cassette according to the embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0027] Hereinafter, embodiments of the present invention will be described with reference to the drawings. FIGS. 1 to 11 are diagrams showing a cash management system according to the present embodiment, a cash settlement device and a cash teller device provided in the cash management system, and a banknote storage cassette used in the cash management system. Among these drawings, FIG. 1 is a block diagram illustrating a configuration example of the cash management system according to the present embodiment. FIG. 2 is a perspective view showing an appearance of the cash settlement device provided in the cash management system shown in FIG. 1. FIG. 3 is a configuration diagram schematically showing an internal configuration of a banknote settlement device in the cash settlement device shown in FIG. 2. FIG. 4 is a functional block diagram showing a configuration of a control system of the cash settlement device shown in FIG. 2. FIG. 5 is a configuration diagram schematically showing an internal configuration of a banknote teller device in the cash teller device provided in the cash management system shown in FIG. 1. FIG. 6 is a functional block diagram showing a configuration of a control system of the cash teller device provided in the cash management system shown in FIG. 1. FIG. 7 is a perspective view schematically showing a configuration of the banknote storage cassette for delivering banknotes between the banknote settlement device and the banknote teller device in the cash management system shown in FIG. 1. FIGS. 8 to 11 are side views of the banknote storage cassette shown in FIG. 7, respectively.

[0028] First, a configuration of a cash management system 1 according to the present embodiment will be described with reference to FIG. 1. The cash management system 1 according to the present embodiment is arranged in a store such as a supermarket, for example. The store where the cash management system 1 is installed is divided into a front area into which the customer can enter and a back office 20 into which the customer can not enter. In the front area, a checkout counter 10 for depositing and dispensing cash exchanged between a clerk and the customer is provided. In the checkout counter 10, one or a plurality of cash settlement devices 11 for performing an adjustment of merchandise with respect to the customer by depositing and dispensing the cash are installed. The cash settlement device 11 is operated by the clerk or the customer himself/herself and is used for the adjustment of merchandise between the clerk and the customer. The cash settlement device 11 has a function of depositing a payment paid by the customer and dispensing a change to be paid to the custom-

er.

[0029] In the back office 20, one or more cash teller devices 21, a cash management device 25, and a Point-Of-Sale (POS) management device 28 are respectively provided. For example, a total of three cash teller devices 21 are provided in the back office 20. The cash teller device 21 is communicably connected to the cash settlement device 11. For example, the cash teller device 21 dispenses a change fund for replenishment to the cash settlement device 11, or deposits a sales proceeds collected from the cash settlement device 11. The cash management device 25 is communicably connected to the cash settlement device 11 and the cash teller device 21 via a LAN (Local Area Network) or the like. The cash management device 25 manages the cash stored in the cash settlement device 11 and the cash teller device 21. More specifically, the cash management device 25 manages the cash of which the adjustment of merchandise is performed in the cash settlement device 11 and the cash exchanged between the cash settlement device 11 and the cash teller device 21. In addition, the Point-Of-Sale (POS) management device 28 is configured to manage a flow of merchandise. Since the flow of merchandise is not directly related to the present invention, detailed explanation on the Point-Of-Sale (POS) management device 28 will be omitted.

[0030] Next, a configuration of the cash settlement device 11 provided in the checkout counter 10 will be described in detail with reference to FIGS. 2 to 4. As shown in FIG. 2, the cash settlement device 11 is composed of a banknote settlement device 12 and a coin settlement device 13 arranged side by side.

[0031] As shown in FIGS. 2 and 3, the banknote settlement device 12 includes a substantially rectangular parallelepiped housing 100, a receiving unit 110, and a dispensing unit 120. As shown in FIG. 3, the receiving unit 110 is provided with a receiving unit cover 111. When the banknotes are deposited, the operator opens the receiving unit cover 111 and puts the banknotes into the receiving unit 110. Within the housing 100 of the banknote settlement device 12, a transporting unit 130 is provided for transporting the banknotes one by one. The receiving unit 110 is provided with a feeding mechanism for feeding out the banknotes put into the receiving unit 110 one by one to the transporting unit 130. The banknotes put into the receiving unit 110 are fed out to the transporting unit 130 by the feeding mechanism and then transported by the transporting unit 130. In the present embodiment, the banknotes in a stacked state are put into the receiving unit 110 along the longitudinal (long edge) direction thereof. The transporting unit 130 is configured to transport the banknotes along their longitudinal (long edge) direction. The transporting unit 130 is provided with a recognition unit 140. The recognition unit 140 recognizes a denomination, fitness, authenticity, and the like of the banknote being transported by the transporting unit 130. In addition, with the recognition unit 140, it is possible to acquire information on a serial number

of the banknote being transported by the transporting unit 130.

[0032] As shown in FIG. 3, a plurality of storage/feeding units 150 are provided in the housing 100 of the banknote settlement device 12. Each storage/feeding unit 150 is connected to the transporting unit 130, respectively. Each storage/feeding unit 150 is configured to store the banknotes by denomination. More specifically, based on the recognition result by the recognition unit 140, the banknotes fed out from the receiving unit 110 to the transporting unit 130 are sent to each storage/feeding unit 150 by the transporting unit 130 by denomination. Each storage/feeding unit 150 is arranged to feed out the banknotes stored in the storage/feeding unit 150 one by one to the transporting unit 130. Each storage/feeding unit 150 may be a tape-reel type storage/feeding unit (see FIG. 3) for winding a pair of tapes together with the banknotes in a state where the banknotes are sandwiched between the pair of tapes one by one. Alternatively, each storage/feeding unit 150 may be a stacker type storage/feeding unit (not shown) for storing the banknotes in a stacked state.

[0033] As shown in FIG. 3, within the housing 100 of the banknote settlement device 12, a cassette mounting unit 160 for mounting a banknote storage cassette 30 to be described later is provided. More specifically, by opening a front cover 101 (see FIG. 2) provided on a front face of the housing 100 of the banknote settlement device 12, the operator can mount the banknote storage cassette 30 on the cassette mounting unit 160 or remove the banknote storage cassette 30 from the cassette mounting unit 160. As shown in FIG. 3, when the banknote storage cassette 30 is mounted on the cassette mounting unit 160, the banknotes fed out from each storage/feeding unit 150 to the transporting unit 130 can be sent to the banknote storage cassette 30 by the transporting unit 130 and stored in the banknote storage cassette 30. In the present embodiment, the banknotes are sent from the transporting unit 130 to the banknote storage cassette 30 along the longitudinal (long edge) direction thereof.

[0034] As shown in FIG. 2, the coin settlement device 13 includes a substantially rectangular parallelepiped housing 170, a receiving unit 172, and a dispensing unit 174. In the coin settlement device 13, the operator can put coins into the housing 170 by the receiving unit 172. The coins put in the housing 170 are stored in a coin storage unit (not shown) provided in the housing 170. Since the coin settlement device 13 is not directly related to the present invention, details of the internal configuration of the coin settlement device 13 will be omitted. When dispensing the coins in the coin settlement device 13, the coins fed out from the coin storage unit are dispensed outside the housing 170 by the dispensing unit 174. The operator can take out the coins from the coin storage unit by opening a front cover 171 provided on a front face of the housing 170 of the coin settlement device 13.

[0035] Next, a configuration of a control system of the cash settlement device 11 including the banknote settlement device 12 and the coin settlement device 13 will be described with reference to FIG. 4. As shown in FIG. 4, a controlling unit 190 is provided in the cash settlement device 11 of the present embodiment, and each component of the banknote settlement device 12 and the coin settlement device 13 is controlled by the controlling unit 190. More specifically, the controlling unit 190 is connected with each of the components such as the receiving unit 110, the dispensing unit 120, the transporting unit 130, the recognition unit 140, the storage/feeding unit 150, and the cassette mounting unit 160 of the banknote settlement device 12, and the receiving unit 172 and the dispensing unit 174 of the coin settlement device 13. Then, these components are controlled by the controlling unit 190. In FIG. 4, the components connected to the controlling unit 190 in the coin settlement device 13, other than the receiving unit 172 and the dispensing unit 174, are omitted. As shown in FIG. 4, the controlling unit 190 is connected with an operation/display unit 195 composed of a touch panel and the like, a memory unit 196 composed of a memory and the like, an interface 197, and the like. The operation/display unit 195 is attached to an upper surface of the housing 100 of the banknote settlement device 12 (see FIG. 2), for example. In the operation/display unit 195, information on the result of depositing/dispersing process of the banknotes and coins in the banknote settlement device 12 and the coin settlement device 13, information on the number of the banknotes and coins stored in the banknote settlement device 12 and the coin settlement device 13, information on the total amount (inventory information) of the banknotes and coins stored in the banknote settlement device 12 and the coin settlement device 13, and the like are displayed. In addition, the operator can give various instructions to the controlling unit 190 by operating the operation/display unit 195. The memory unit 196 stores information on the history of depositing/dispersing process of the banknotes and coins in the banknote settlement device 12 and the coin settlement device 13, information on the number of the banknotes and coins stored in the banknote settlement device 12 and the coin settlement device 13, information on the total amount (inventory information) of the banknotes and coins stored in the banknote settlement device 12 and the coin settlement device 13, and the like. The memory unit 196 also stores information such as the recognition information of each of the banknotes stored in the banknote storage cassette 30, the serial number of each of the banknotes corresponding to the recognition information, the storage order of each of the banknotes in the banknote storage cassette 30, and the like. The controlling unit 190 can transmit/receive signals to/from an external device via the interface 197.

[0036] Next, a configuration of the cash teller device 21 provided in the back office 20 will be described in detail with reference to FIGS. 5 and 6. In the present

embodiment, the cash teller device 21 is composed of a banknote teller device 22 and a coin teller device (not shown) arranged side by side. Since the coin teller device is not directly related to the present invention, the description of the configuration of the coin teller device will be omitted.

[0037] As shown in FIG. 5, the banknote teller device 22 is composed of two units consisting of an upper assembly 202 and a lower assembly 204. In addition, the banknote teller device 22 includes a substantially rectangular parallelepiped housing 200, a receiving unit 210, and a dispensing unit 220. In the housing 200 of the banknote teller device 22, a transporting unit 230 for transporting the banknotes one by one is provided. In the receiving unit 210, there is provided a feeding mechanism for feeding out the banknotes put into the receiving unit 210 one by one to the transporting unit 230. The banknotes put into the receiving unit 210 are fed out to the transporting unit 230 by the feeding mechanism and then transported by the transporting unit 230. In the present embodiment, the banknotes in a stacked state are put into the receiving unit 210 along the short edge direction thereof. The transporting unit 230 is configured to transport the banknotes along their short edge direction. The transporting unit 230 has two connecting paths (concretely, a first connecting path 232 and a second connecting path 234) for connecting the upper assembly 202 and the lower assembly 204, respectively. The transporting unit 230 is provided with a recognition unit 240. The recognition unit 240 recognizes a denomination, fitness, authenticity, and the like of the banknote being transported by the transporting unit 230. In addition, by the recognition unit 240, it is possible to acquire information on the serial number of the banknote being transported by the transporting unit 230. An escrow unit 245 is connected to the transporting unit 230. The banknotes recognized by the recognition unit 240 are sent to the escrow unit 245 by the transporting unit 230 and are temporarily escrowed in the escrow unit 245. These receiving unit 210, dispensing unit 220, recognition unit 240 and escrow unit 245 are provided in the upper assembly 202.

[0038] As shown in FIG. 5, a plurality of storage/feeding units 250 are provided in the housing 200 of the banknote teller device 22. Each storage/feeding unit 250 is connected to the transporting unit 230, respectively. Each storage/feeding unit 250 stores the banknotes by denomination. More specifically, based on the recognition result by the recognition unit 240, the banknotes temporarily escrowed in the escrow unit 245 are fed out from the escrow unit 245 to the transporting unit 230, and are sent to each storage/feeding unit 250 by the transporting unit 230 by denomination. In the banknote teller device 22 according to the present embodiment, when the banknotes are deposited, instead of temporarily escrowing the banknotes recognized by the recognition unit 240 in the escrow unit 245, the banknotes recognized by the recognition unit 240 may be sent directly to each storage/feeding unit 250 without being temporarily escrowed

in the escrow unit 245. Each storage/feeding unit 250 is configured so that the banknotes stored in the storage/feeding unit 250 can be fed out one by one to the transporting unit 230. Each storage/feeding unit 250 may be a tape-reel type storage/feeding unit (see FIG. 5) for winding a pair of tapes together with the banknotes in a state in which the banknotes are sandwiched between the pair of tapes one by one. Alternatively, each storage/feeding unit 250 may be a stacker type storage/feeding unit (not shown) for storing the banknotes in a stacked state. Each storage/feeding unit 250 is provided in the lower assembly 204.

[0039] As shown in FIG. 5, in the housing 200 of the banknote teller device 22, a cassette mounting unit 260 for mounting the banknote storage cassette 30 to be described later is provided. More specifically, by opening a front cover (not shown) provided on a front face of the housing 200 of the banknote teller device 22, the operator can mount the banknote storage cassette 30 on the cassette mounting unit 260 or remove the banknote storage cassette 30 from the cassette mounting unit 260. As shown in FIG. 5, when the banknote storage cassette 30 is mounted on the cassette mounting unit 260, after recognizing the banknote fed out from each storage/feeding unit 250 to the transporting unit 230 by the recognition unit 240, it can be sent to the banknote storage cassette 30 by the transporting unit 230 and stored in the banknote storage cassette 30. In addition, when the banknote storage cassette 30 is mounted on the cassette mounting unit 260, the banknotes stored in the banknote storage cassette 30 can be fed out to the transporting unit 230 and recognized by the recognition unit 240 and then sent to each storage/feeding unit 250 by the transporting unit 230. The cassette mounting unit 260 is provided in the lower assembly 204. In the present embodiment, the banknotes stored in the banknote storage cassette 30 are fed out to the transporting unit 230 along the short edge direction thereof. In the present embodiment, when the banknote storage cassette 30 is mounted on the cassette mounting unit 260, information stored in a memory unit 90 (described later) such as a memory provided on a side surface of the banknote storage cassette 30 is read by a reader/writer 262 (described later) provided in the cassette mounting unit 260. As a result, the banknotes fed out from the banknote storage cassette 30 may be stored in each storage/feeding unit 250 based on information acquired from the memory unit 90 by the reader/writer 262.

[0040] In the present embodiment, instead of mounting the banknote storage cassette 30 on the cassette mounting unit 260, or in addition to mounting the banknote storage cassette 30 on the cassette mounting unit 260, the banknote storage cassette 30 may be mounted on the receiving unit 210. In this case, the banknotes can be fed out from the banknote storage cassette 30 mounted on the receiving unit 210 to the transporting unit 230, and the banknotes can be sent from the transporting unit 230 to the banknote storage cassette 30 mounted on the re-

ceiving unit 210. Furthermore, in this case, a reader/writer (not shown) for writing information in the memory unit 90 (described later) of the banknote storage cassette 30 and reading information from the memory unit 90, when the banknote storage cassette 30 is mounted on the receiving unit 210, may be provided in the receiving unit 210. In this case, when the banknote storage cassette 30 is mounted on the receiving unit 210, information on the storage order of each of the banknotes stored in the banknote storage cassette 30 and information on the serial number and denomination of each of the banknotes in association with the storage order of each of the banknotes acquired by the recognition unit 140 of the banknote settlement device 12, stored in the memory unit 90, can be read by the reader/writer provided in the receiving unit 210. In addition, when the banknotes are fed out to the inside of the housing 200 from the banknote storage cassette 30 mounted on the receiving unit 210 and stored in each storage/feeding unit 250, based on the information acquired from the memory unit 90 by the reader/writer provided in the receiving unit 210, the banknotes fed out from the banknote storage cassette 30 may be stored in each storage/feeding unit 250. In this case, it is unnecessary to recognize the banknote fed out to the inside of the housing 200 from the banknote storage cassette 30 mounted on the receiving unit 210 by the recognition unit 240. If the recognition unit 240 recognizes the banknote fed out from the banknote storage cassette 30 mounted on the receiving unit 210 to the inside of the housing 200, the banknote recognized as not being a normal banknote by the recognition unit 240 or the banknote recognized as a transport error is stored as a reject banknote in a collection unit (not shown).

[0041] In addition, if the banknote storage cassette 30 can be mounted on the receiving unit 210, when storing the banknotes in the banknote storage cassette 30 in the banknote teller device 22 to make a replenishment money, after recognizing the banknote fed out from each storage/feeding unit 250 to the transporting unit 230 by the recognition unit 240, it can be stored in the banknote storage cassette 30 mounted on the receiving unit 210. In this case, the recognition information such as the serial number and the like of each of the banknotes stored in the banknote storage cassette 30 acquired by the recognition unit 240 can be written to the memory unit 90 (described later) of the banknote storage cassette 30 by the reader/writer provided in the receiving unit 210.

[0042] Next, a configuration of a control system of the cash teller device 21 including the banknote teller device 22 and the coin teller device (not shown) will be described with reference to FIG. 6. As shown in FIG. 6, in the cash teller device 21 of the present embodiment, a controlling unit 290 is provided, and each component of the banknote teller device 22 and the coin teller device is controlled by the controlling unit 290. More specifically, the controlling unit 290 is connected with each of the components such as the receiving unit 210, the dispensing unit 220, the transporting unit 230, the recognition unit

240, the escrow unit 245, the storage/feeding unit 250, the cassette mounting unit 260 and the like of the banknote teller device 22, and the components of the coin teller device. Then, these components are controlled by controlling unit 290. In FIG. 6, the components of the coin teller device connected to the controlling unit 290 are omitted. Further, as shown in FIG. 6, an operation/display unit 295 composed of, for example, a touch panel and the like, a memory unit 296 composed of a memory and the like, an interface 297, and the like are connected to the controlling unit 290. In the operation/display unit 295, information on the result of depositing/dispensing process of the banknotes and coins in the banknote teller device 22 and the coin teller device, information on the number of the banknotes and coins stored in the banknote teller device 22 and the coin teller device, information on the total amount (inventory information) of the banknotes and coins stored in the banknote teller device 22 and the coin teller device, and the like are displayed. In addition, the operator can give various instructions to the controlling unit 290 by operating the operation/display unit 295. The memory unit 296 stores information on the history of depositing/dispensing process of the banknotes and coins in the banknote teller device 22 and the coin teller device, information on the number of the banknotes and coins stored in the banknote teller device 22 and the coin teller device, information on the total amount (inventory information) of the banknotes and coins stored in the banknote teller device 22 and the coin teller device, and the like. The memory unit 296 also stores information such as the recognition information of each of the banknotes stored in the banknote storage cassette 30, the serial number of each of the banknotes corresponding to the recognition information, the storage order of each of the banknotes in the banknote storage cassette 30, and the like. The controlling unit 290 can transmit/receive signals to/from an external device via the interface 297.

[0043] In the present embodiment, as described above, in the banknote settlement device 12 of the cash settlement device 11 in the cash management system 1, the banknotes are transported along the longitudinal direction thereof by the transporting unit 130. Therefore, it is possible to reduce the space in which the banknote settlement device 10 is installed by reducing the width of the housing 100 of the banknote settlement device 12. Furthermore, the recognition unit 140 installed in the banknote settlement device 12 can be made inexpensive. In addition, in the banknote teller device 22 of the cash teller device 21, the banknotes are transported along the short edge direction thereof by the transporting unit 230. Therefore, in each storage/feeding unit 250 of the banknote teller device 22, the banknotes are stored along the short edge direction thereof. As a result, it is possible to increase the amount of the banknotes stored in each storage/feeding unit 250, as compared with the case where the banknotes are stored along the longitudinal direction thereof. Therefore, it is possible to increase the amount of the banknotes stored in the banknote teller

device 22 as a whole. Further, in the banknote teller device 22, when transporting the banknotes along the short edge direction thereof by the transporting unit 230, it is possible to improve the processing speed of the banknotes as compared with the case of transporting the banknotes along their longitudinal direction. Therefore, work efficiency in the banknote teller device 22 can be improved.

[0044] Next, a configuration of the banknote storage cassette 30 for delivering the banknotes between the banknote settlement device 12 and the banknote teller device 22 will be described in detail with reference to FIGS. 7 to 11. FIG. 7 is a perspective view schematically showing the configuration of the banknote storage cassette 30. FIG. 8 is a side view showing a state in which the banknotes are stored in the banknote storage cassette 30 in the banknote settlement device 12. FIG. 9 is a side view showing a state when the banknote storage cassette 30 is removed from the banknote settlement device 12 after the banknotes are stored in the banknote storage cassette 30 in the banknote settlement device 12. FIG. 10 is a side view showing a state in which the banknotes are fed out from the banknote storage cassette 30 in the banknote teller device 22. FIG. 11 is a side view showing a state when the banknote storage cassette 30 shown in FIG. 10 is viewed from the side. In FIGS. 8 to 11, the banknotes stored in the banknote storage cassette 30 are indicated by reference symbol P.

[0045] A housing 31 of the banknote storage cassette 30 indicated by the two-dot chain line in FIG. 7 has a substantially rectangular parallelepiped shape. The lateral size of the housing 31 (that is, the length in the left-right direction in FIG. 7) is larger than the size in the lengthwise direction (that is, the length in the depth direction in FIG. 7). Therefore, in FIG. 7, the banknotes are stored in the banknote storage cassette 30 so that their longitudinal direction is the lateral direction of the housing 31 (that is, the left-right direction in FIG. 7). On the side surfaces of the banknote storage cassette 30, two banknote inlet/outlet openings 38, 48 are provided. In the present embodiment, the side surfaces of the housing 31 provided with each of the two inlet/outlet openings 38, 48 are different from each other. More specifically, the inlet/outlet openings 38 and 48 are provided on the two mutually adjacent side surfaces of the housing 31, respectively. In particular, the inlet/outlet opening 48 extends along the lateral direction of the housing 31 (that is, the left-right direction in FIG. 7), and the inlet/outlet opening 38 extends along the lengthwise direction of the housing 31 (that is, the depth direction in FIG. 7). The width of the inlet/outlet opening 48 is larger than the width of the inlet/outlet opening 38. In the present embodiment, when the banknotes are taken in and out of the banknote storage cassette 30 along the short edge direction thereof, the banknotes are put in and out of the banknote storage cassette 30 via the inlet/outlet opening 48. When the banknotes are taken in and out of the banknote storage cassette 30 along the longitudinal direction thereof, the

banknotes are put in and out of the banknote storage cassette 30 via the inlet/outlet opening 38.

[0046] A pair of plate members 50 and 52 are provided inside the housing 31 of the banknote storage cassette 30 so as to be aligned in the vertical direction. These plate members 50 and 52 are movable independently in the vertical direction in FIG. 7. The banknotes stored in the banknote storage cassette 30 are sandwiched between these plate members 50 and 52 in a stacked state. More specifically, endless belts (not shown) extending vertically in the housing 31 of the banknote storage cassette 30 are connected to the plate members 50 and 52, respectively. These endless belts are circulated by drive motors (not shown) provided in the housing 31 of the banknote storage cassette 30, so that the plate members 50 and 52 move independently in the vertical direction in FIG. 7. In the present embodiment, a combination of these plate members 50, 52 constitutes a storage unit for storing the banknotes.

[0047] Of these pair of the plate members 50, 52, one plate member functions as a placing plate on which the banknotes are stacked in a stacked state and the other plate member functions as a guide plate for guiding the banknotes when the banknotes are sent from the outside to the inside of the housing 31 of the banknote storage cassette 30. A storage space for the banknotes is formed between these placing plate and the guide plate. In the present invention, the concept of "to guide the banknotes" also includes an aspect in which the plate members 50 and 52 retreat to the outside from endless belts 34 of a first storage/feeding mechanism 32 and kicker rollers 44 of a second storage/feeding mechanism 42 to be described later so that the banknotes sent into the housing 31 through the inlet/outlet opening 38, 48 do not come into contact with the plate members 50, 52. Furthermore, in the present embodiment, the banknote storage cassette 30 can be used by turning it upside down from the state as shown in FIG. 7. That is, when the banknote storage cassette 30 is in the state as shown in FIG. 7, the plate member 52 positioned on the lower side functions as the placing plate and the plate member 50 positioned on the upper side functions as the guide plate. When the banknote storage cassette 30 is turned upside down from the state as shown in FIG. 7, the plate member 50 functions as the placing plate and the plate member 52 functions as the guide plate. As described above, in the present embodiment, when the banknote storage cassette 30 is disposed in the opposite direction so that the stacking direction of the banknotes in the housing 31 of the banknote storage cassette 30 is reversed, the functions of the placing plate and the guide plate of the pair of plate members 50 and 52 are interchanged. Details of such technical matters will be described later.

[0048] In the present embodiment, the plate member functioning as the guide plate among the pair of the plate members 50, 52 (for example, the plate member 50 when the banknote storage cassette 30 is in the state as shown in FIG. 7) can be inclined obliquely downward with re-

spect to the direction of sending the banknote from the inlet/outlet opening 48 to the inside of the housing 31 (that is, the depth direction in FIG. 7). In this case, in the banknote storage cassette 30, a leading end portion of the banknote sent from the inlet/outlet opening 48 to the inside of the housing 31 comes into contact with a lower surface of the plate member 50 that is inclined with respect to the feeding direction of the banknote, and then the leading end portion of the banknote is guided along the lower surface of the plate member 50. As a result, this banknote is stacked in an aligned state on the banknotes already stacked in the plate member 52 functioning as the placing plate. In this way, when the plate member 50 functioning as the guide plate among the pair of plate members is inclined obliquely downward with respect to the feeding direction of the banknote from the inlet/outlet opening 48 to the inside of the housing 31, the banknote sent from the inlet/outlet opening 48 to the inside of the housing 31 can be guided smoothly by the plate member 50 and stacked on the plate member 52.

[0049] In the housing 31 of the banknote storage cassette 30, the first storage/feeding mechanism 32 is provided at a position in the vicinity of the inlet/outlet opening 38 (that is, a lower area inside the housing 31). The first storage/feeding mechanism 32 stores the banknotes, sent to the inside of the housing 31 from the outside of the housing 31 of the banknote storage cassette 30 via the inlet/outlet opening 38, in the banknote storage cassette 30. In addition, the first storage/feeding mechanism 32 feeds out the banknotes stored in the banknote storage cassette 30 one by one to the outside of the housing 31 via the inlet/outlet opening 38. More specifically, the first storage/feeding mechanism 32 has the four endless belts 34 and two backward rotation rollers 36. When the banknotes are fed out to the outside of the housing 31 via the inlet/outlet opening 38 by the first storage/feeding mechanism 32, the endless belts 34 circulate in the clockwise direction in FIG. 7 and the backward rotation rollers 36 rotate in the clockwise direction in FIG. 7. As a result, the banknotes pass one by one through a gap between the right endless belt 34 and the backward rotation roller 36 in FIG. 7 and are sent from the inlet/outlet opening 38 to the right side in FIG. 7.

[0050] The plate member 52 is provided with a plurality of openings 52a through which each endless belt 34 can pass. This allows the plate member 52 to move to a lower position in FIG. 7 than each endless belt 34. When the banknotes stored in the banknote storage cassette 30 are fed out to the outside of the housing 31 one by one through the inlet/outlet opening 38 by the first storage/feeding mechanism 32, the plate member 52 is retracted to the lower position in FIG. 7 than each endless belt 34. Then, among the plurality of banknotes sandwiched between the plate members 50 and 52, the banknote located at the lowermost layer in FIG. 7 comes into contact with the respective endless belts 34.

[0051] In the housing 31 of the banknote storage cassette 30, the second storage/feeding mechanism 42 is

provided at a position in the vicinity of the inlet/outlet opening 48 (that is, an upper region inside the housing 31). The second storage/feeding mechanism 42 stores the banknotes, sent to the inside of the housing 31 from the outside of the housing 31 of the banknote storage cassette 30 via the inlet/outlet opening 48, in the banknote storage cassette 30. In addition, the second storage/feeding mechanism 42 feeds out the banknotes stored in the banknote storage cassette 30 one by one to the outside of the housing 31 via the inlet/outlet opening 48. More specifically, the second storage/feeding mechanism 42 has two kicker rollers 44, two feed rollers 45 and two backward rotation rollers 46. When the banknotes stored in the banknote storage cassette 30 are fed out to the outside of the housing 31 one by one through the inlet/outlet opening 48 by the second storage/feeding mechanism 42, the banknotes are kicked out one by one toward a front side in FIG. 7 by the kicker rollers 44. Then, the kicked banknotes pass through a gap between the feed roller 45 and the backward rotation roller 46, and are fed out one by one from the inlet/outlet opening 48 to the front side in FIG. 7.

[0052] The plate member 50 is provided with a plurality of openings 50a through which each kicker roller 44 can pass. This allows the plate member 50 to move to an upper position in FIG. 7 than each kicker roller 44. When the banknotes stored in the banknote storage cassette 30 are fed out to the outside of the housing 31 one by one through the inlet/outlet opening 48 by the second storage/feeding mechanism 42, the plate member 50 is retracted to the upper position in FIG. 7 than each kicker roller 44. Then, among the plurality of banknotes sandwiched between the plate members 50 and 52, the banknote located at the uppermost layer in FIG. 7 comes into contact with the respective kicker rollers 44.

[0053] As described above, in the present embodiment, the feeding direction of the banknote by the first storage/feeding mechanism 32 and the feeding direction of the banknote by the second storage/feeding mechanism 42 are different from each other. In other words, the feeding direction of the banknote by the first storage/feeding mechanism 32 is the left-right direction in FIG. 7, whereas the feeding direction of the banknote by the second storage/feeding mechanism 42 is the depth direction in FIG. 7. In this manner, the feeding direction of the banknote by the first storage/feeding mechanism 32 and the feeding direction of the banknote by the second storage/feeding mechanism 42 are substantially orthogonal. Each of the first storage/feeding mechanism 32 and the second storage/feeding mechanism 42 is provided at a position on the opposite side in the stacking direction of the banknotes in the housing 31 of the banknote storage cassette 30 (ie, the vertical direction in FIG. 7).

[0054] As shown in FIG. 7, in the vicinity of the first storage/feeding mechanism 32, a remaining material detecting sensor 62 for detecting the banknote or banknotes remaining in the banknote storage cassette 30, when the

first storage/feeding mechanism 32 feeds out the banknotes from the banknote storage cassette 30 to the outside of the housing 31 via the inlet/outlet opening 38, is provided. Specifically, the remaining material detecting sensor 62 has a light emitting element 62a and a light receiving element 62b. Light emitted from the light emitting element 62a passes through an optical path indicated by a two-dot chain line in FIG. 7 and is received by the light receiving element 62b. When the banknotes are fed out to the outside of the housing 31 by the first storage/feeding mechanism 32, if one or more banknotes remain in the banknote storage cassette 30, the remaining banknote or banknotes interrupt the optical path between the light emitting element 62a and the light receiving element 62b so that the remaining banknote or banknotes are detected by the remaining material detecting sensor 62. Similarly, in the vicinity of the second storage/feeding mechanism 42, a remaining material detecting sensor 60 for detecting the banknote or banknotes remaining in the banknote storage cassette 30, when the second storage/feeding mechanism 42 feeds out the banknotes from the banknote storage cassette 30 to the outside of the housing 31 via the inlet/outlet opening 48, is provided. Specifically, the remaining material detecting sensor 60 has a light emitting element 60a and a light receiving element 60b. Light emitted from the light emitting element 60a passes through an optical path indicated by a two-dot chain line in FIG. 7 and is received by the light receiving element 60b. When the banknotes are fed out to the outside of the housing 31 by the second storage/feeding mechanism 42, if one or more banknotes remain in the banknote storage cassette 30, the remaining banknote or banknotes interrupt the optical path between the light emitting element 60a and the light receiving element 60b so that the remaining banknote or banknotes are detected by the remaining material detecting sensor 60.

[0055] As shown in FIG. 7, in the housing 31 of the banknote storage cassette 30, there is provided a banknote detecting sensor 64 for detecting the banknote or the banknotes left between the plate members 50 and 52, when each of the plate members 50 and 52 is positioned at a center position in the height direction of the housing 31. Specifically, the banknote detecting sensor 64 has a light emitting element 64a, a light receiving element 64b, and a light reflection prism 64c. Light emitted from the light emitting element 64a is reflected by the light reflection prism 64c and then received by the light receiving element 64b. Each plate member 50, 52 is provided with a through hole for allowing light emitted from the light emitting element 64a or light reflected by the light reflection prism 64c to pass therethrough. When each of the plate members 50, 52 is positioned at the center position in the height direction of the housing 31, if one or more banknotes are left between these plate members 50 and 52, the banknote or banknotes interrupt the optical path between the light emitting element 64a and the light reflection prism 64c or between the light

receiving element 64b and the light reflection prism 64c, whereby the banknote or banknotes left between the plate members 50 and 52 are detected by the banknote detecting sensor 64.

[0056] At the side of the housing 31 of the banknote storage cassette 30, connectors 66 and 68 are respectively provided near the upper end portion and the lower end portion. With these connectors 66 and 68, the banknote storage cassette 30 receives electric power (driving force) from an external device (specifically, the banknote settlement device 12 or the banknote teller device 22 on which the banknote storage cassette 30 is mounted). More specifically, the banknote settlement device 12 and the banknote teller device 22 are provided with a main body connector to which one connector of the connectors 66, 68 of the banknote storage cassette 30 is connected. When the banknote storage cassette 30 is mounted on the banknote settlement device 12 or the banknote teller device 22 and the main body connector of the banknote settlement device 12 or banknote teller device 22 and the connector of the banknote storage cassette 30 (one of the connectors 66 and 68) are connected, the electric power is supplied from the banknote settlement device 12 or the banknote teller device 22 to the banknote storage cassette 30. Then, the drive motors for driving the respective plate members 50 and 52, the first storage/feeding mechanism 32, the second storage/feeding mechanism 42, and the like are driven by the supplied electric power. The two connectors 66, 68 are provided on the opposite side in the stacking direction of the banknotes (that is, in the vertical direction in FIG. 7). Therefore, even when the banknote storage cassette 30 according to the present embodiment is mounted on the external device such as the banknote settlement device 12 or the banknote teller device 22 in the upside-down state, the opposite connector of the pair of connectors 66, 68 is connected to the external device, and then the banknote storage cassette 30 can receive the electric power from the external device. The controlling unit 190 of the cash settlement device 11 and the controlling unit 290 of the cash teller device 21 detect which connector 66, 68 is connected to the external device such as the banknote settlement device 12 or the banknote teller device 22. As a result, it can be determined which one of the first storage/feeding mechanism 32 and the second storage/feeding mechanism 42 in the banknote storage cassette 30 should be operated. It should be noted that the present embodiment is not limited to the aspect in which the pair of connectors 66, 68 are installed in the banknote storage cassette 30. As a modification, even in the case where the number of connectors installed in the banknote storage cassette 30 is one and the banknote storage cassette 30 is mounted on the external device such as the banknote settlement device 12 or the banknote teller device 22 with the banknote storage cassette 30 turned upside down, a position of the main body connector in the banknote settlement device 12 or the banknote teller device 22 may be set so as to correspond

to the position of the connector provided in the banknote storage cassette 30.

[0057] As shown in FIG. 1, handles 31a and 31b are provided on the upper and lower surfaces of the housing 31 of the banknote storage cassette 30, respectively. When the operator carries the banknote storage cassette 30 between the banknote settlement device 12 and the banknote teller device 22, the operator grips one handle 31a of the pair of the upper and lower handles 31a and 31b. In this embodiment, as described above, since the banknote storage cassette 30 can be used by turning upside down from the state as shown in FIG. 7, if the handles 31a and 31b are provided on the upper surface and the lower surface of housing 31, respectively, the operator can grip the opposite handle when the banknote storage cassette 30 is turned upside down.

[0058] As shown in FIG. 7, the memory unit 90 such as a memory is provided on the side surface of the banknote storage cassette 30. The memory unit 90 stores information on the banknotes stored in the banknote storage cassette 30. Specifically, the memory unit 90 stores the information acquired by the recognition unit 140 of the banknote settlement device 12 or the recognition unit 240 of the banknote teller device 22 such as the serial number, denomination and the like of each of the banknotes stored in the banknote storage cassette 30 in association with the storage order of each of the banknotes in the banknote storage cassette 30. As shown in FIG. 4, a reader/writer 162 is provided in the cassette mounting unit 160 of the banknote settlement device 12. When the banknote storage cassette 30 is mounted on the cassette mounting unit 160, the reader/writer 162 writes information in the memory unit 90 of this banknote storage cassette 30 or reads information from the memory unit 90. Furthermore, as shown in FIG. 6, a reader/writer 262 is also provided in the cassette mounting unit 260 of the banknote teller device 22. When the banknote storage cassette 30 is mounted on the cassette mounting unit 260, the reader/writer 262 writes information in the memory unit 90 of this banknote storage cassette 30 or reads information from the memory unit 90.

[0059] Next, the operation of delivering the banknotes from the banknote settlement device 12 to the banknote teller device 22 using the banknote storage cassette 30 will be described with reference to FIGS. 8 to 11. The following operations are carried out by the controlling unit 190 of the cash settlement device 11 controlling each component of the banknote settlement device 12 and the controlling unit 290 of the cash teller device 21 controlling each component of the banknote teller device 22.

[0060] In delivering the banknotes from the banknote settlement device 12 to the banknote teller device 22, the banknote storage cassette 30 is first mounted on the cassette mounting unit 160 of the banknote settlement device 12. At this time, the banknote storage cassette 30 is turned upside down from the state shown in FIG. 7 and mounted on the cassette mounting unit 160. FIG. 8 is a side view showing a state in which the banknotes are

stored in the banknote storage cassette 30 in the banknote settlement device 12. When the banknotes are stored in the banknote storage cassette 30 in the banknote settlement device 12, as shown in FIG. 8, the plate member 52 functioning as the guide plate retreats above each endless belt 34 of the first storage/feeding mechanism 32. In addition, each endless belt 34 of the first storage/feeding mechanism 32 circulates in the counter-clockwise direction in FIG. 8. As a result, in the banknote settlement device 12, when the banknotes delivered from each storage/feeding unit 150 are sent to the banknote storage cassette 30 by the transporting unit 130, the banknotes sent into the housing 31 via the inlet/outlet opening 38 are sent to the right direction in FIG. 8 by each endless belt 34 of the first storage/feeding mechanism 32. Then, the banknotes fall freely on the plate member 50 functioning as the placing plate and are stacked in a stacked state.

[0061] When the banknotes are stored in the banknote storage cassette 30 in the banknote settlement device 12, information is written in the memory unit 90 of the banknote storage cassette 30 by the reader/writer 162 provided in the cassette mounting unit 160. More specifically, the reader/writer 162 writes the storage order of each of the banknotes, sent from the transporting unit 130 of the banknote settlement device 12 to the inside of the housing 31 of the banknote storage cassette 30 and stored in the banknote storage cassette 30, in association with the serial number of each of the banknotes, in the memory unit 90.

[0062] When the banknote storage cassette 30 is removed from the cassette mounting unit 160 of the banknote settlement device 12 after the banknotes are stored in the banknote storage cassette 30 in the banknote settlement device 12, the plate members 50 and 52 move downward with the banknotes interposed therebetween. Then, these plate members 50 and 52 are located at the center position in the height direction of the housing 31 (see FIG. 9). This makes it possible to prevent the banknotes stored in the banknote storage cassette 30 from being drawn out from the respective inlet/outlet opening 38, 48, when carrying the banknote storage cassette 30 between the banknote settlement device 12 and the banknote teller device 22. Therefore, it is possible to improve the anti-theft property of the banknote storage cassette 30.

[0063] Next, before mounting the banknote storage cassette 30 in which the banknotes are stored in the housing 31 on the cassette mounting unit 260 of the banknote teller device 22, the banknote storage cassette 30 is turned upside down in advance from the state shown in FIG. 8 and FIG. 9. Then, the banknote storage cassette 30 is mounted on the cassette mounting unit 260 with the inlet/outlet opening 48 positioned above (see FIGS. 10 and 11). Thereafter, from this state, each plate member 50, 52 is moved upward in FIGS. 10 and 11, respectively, and the plate member 50 retreats above each kicker roller 44 of the second storage/feeding mechanism

42. Then, the kicker rollers 44, the feed rollers 45 and the backward rotation rollers 46 are rotated counterclockwise in FIG. 11, respectively. In this way, among the plurality of banknotes stacked on the plate member 52, the banknote located at the uppermost layer is kicked out one by one in the right direction in FIG. 11 by the kicker rollers 44, and the kicked banknote is fed out one by one from the inlet/outlet opening 48 by the feed rollers 45 in the right direction. In this manner, the banknotes fed out from the banknote storage cassette 30 to the outside of the housing 31 by the second storage/feeding mechanism 42 are sent to each storage/feeding unit 250 by the transporting unit 230 of the banknote teller device 22, and stored in each storage/feeding units 250 by denomination.

[0064] When the banknotes stored in the banknote storage cassette 30 are sent to the banknote teller device 22, the information stored in the memory unit 90 of the banknote storage cassette 30 is read by the reader/writer 262 provided in the cassette mounting unit 260. More specifically, the reader/writer 262 reads the information on the storage order of each of the banknotes stored in the banknote storage cassette 30 and information acquired by the recognition unit 140 of the banknote settlement device 12, such as the serial number, the denomination and the like of each of the banknotes associated with the storage order of each of the banknotes, stored in the memory unit 90. In this embodiment, the controlling unit 290 of the banknote teller device 22 determines the order of the banknotes sent from the banknote storage cassette 30 to the main body of the banknote teller device 22, based on the type of storage/feeding mechanism used in the banknote storage cassette 30 mounted on the cassette mounting unit 260 of the banknote teller device 22. In the present embodiment, when the banknote storage cassette 30 is mounted on the banknote teller device 22, the second storage/feeding mechanism 42 is used as shown in FIG. 11 and the like, and the second storage/feeding mechanism 42 is different from the first storage/feeding mechanism 32 that is used when the banknotes are stored in the banknote storage cassette 30. Therefore, the order in which the banknotes are stored in the banknote storage cassette 30 in the banknote settlement device 12 needs to be the same as the order in which banknotes are fed out from the banknote storage cassette 30 in the banknote teller device 22. That is, the banknote stored first in the banknote storage cassette 30 in the banknote settlement device 12 is fed out first from the banknote storage cassette 30 in the banknote teller device 22. In addition, the banknote stored last in the banknote storage cassette 30 in the banknote settlement device 12 is fed out last from the banknote storage cassette 30 in the banknote teller device 22. Therefore, when the information stored in the memory unit 90 of the banknote storage cassette 30 is read by the reader/writer 262, it is necessary that the controlling unit 290 of the banknote teller device 22 sets the order of each of the banknotes associated with the banknote

serial number to be the same. The reader/writer 162 provided in the cassette mounting unit 160 of the banknote settlement device 12 also determines the order of each of the banknotes sent from the banknote storage cassette 30 to the main body of the banknote settlement device 12 in the same way as the above reader/writer 262, based on the type of storage/feeding mechanism used in the banknote storage cassette 30 mounted on the cassette mounting unit 160 of the banknote settlement device 12.

[0065] According to the banknote storage cassette 30 of the present embodiment having the above configuration and the cash management system 1 using the banknote storage cassette 30, a plurality of storage/feeding mechanisms 32, 42 are provided in the banknote storage cassette 30, and the feeding directions of the banknotes by the storage/feeding mechanisms 32, 42 are different from each other. Thereby, between the banknote settlement device 12, in which the banknotes are transported along the longitudinal (long edge) direction thereof, and the banknote teller device 22, in which banknotes are transported along the short edge direction thereof, the banknotes can be delivered by the banknote storage cassette 30 such that the banknotes are not touched by the operator's hand. That is, when the banknote storage cassette 30 is mounted on the banknote settlement device 12, the first storage/feeding mechanism 32 is used as shown in FIG. 8. In addition, when the banknote storage cassette 30 is mounted on the banknote teller device 22, the second storage/feeding mechanism 42 is used as shown in FIGS. 10 and 11. As a result, the banknotes can be sent in both short edge direction and long edge direction thereof in taking out and inserting the banknotes with respect to the banknote storage cassette 30. As described above, by using the banknote storage cassette 30 according to the present embodiment, the banknotes can be delivered between two banknote handling devices in which the banknotes are oriented differently when they are transported (specifically, the banknote settlement device 12 and the banknote teller device 22). Therefore, it is possible to improve the convenience for the operator and to improve the anti-theft property. Furthermore, according to the cash management system 1 in which the banknote storage cassette 30 is used, with respect to the banknote settlement device 12 of the cash settlement device 11 installed in the checkout counter 10, the width of the housing can be reduced to save space and the recognition unit 140 installed in the banknote settlement device 12 can be made inexpensive. In addition, with respect to the banknote teller device 22 of the cash teller device 21 installed in the back office 20, it is possible to increase the storage amount of the banknotes. In the banknote teller device 22, when transporting the banknotes along the short edge direction thereof by the transporting unit 230, it is possible to improve the processing speed of the banknotes, as compared with the case of transporting the banknotes along the longitudinal direction thereof. Therefore, work efficiency in the banknote teller device 22 can be improved.

[0066] Furthermore, according to the banknote storage cassette 30 of the present embodiment, as described above, inside of the banknote storage cassette 30, the banknotes are stored in a stacked state. In addition, the first storage/feeding mechanism 32 and the second storage/feeding mechanism 42 are provided at the positions on the opposite side in the stacking direction of the banknotes (that is, the up and down direction in FIG. 7). Further, in this embodiment, the stacking direction of the banknotes (that is, the vertical direction in FIG. 7) is reversed between when the first storage/feeding mechanism 32 is used and when the second storage/feeding mechanism 42 is used. That is, compared with the case where the banknote storage cassette 30 is mounted on the banknote settlement device 12, when the banknote storage cassette 30 is mounted on the banknote teller device 22, the banknote storage cassette 30 can be mounted upside down.

[0067] Furthermore, according to the banknote storage cassette 30 of the present embodiment, as described above, between the first storage/feeding mechanism 32 and the second storage/feeding mechanism 42, a placement unit on which the banknotes are placed

[0068] (specifically, the plate members 50 and 52) are provided. In addition, a first storage/feeding space is formed between the first storage/feeding mechanism 32 and this placement unit, and a second storage/feeding space is formed between the second storage/feeding mechanism 42 and this placement unit. Specifically, the placement unit has the plate member 50 as a first placement portion and the plate member 52 as a second placement portion. It is possible to store and feed out the banknotes in a space between the first storage/feeding mechanism 32 and the plate member 50 as the first placement portion of the placement unit. It is also possible to store and feed out the banknotes in a space between the second storage/feeding mechanism 42 and the plate member 52 as the second placement portion of the placement unit.

[0069] Of the plate member 50 as the first placement portion and the plate member 52 as the second placement portion, one plate member functions as the placing plate on which the banknotes are placed in a stacked state, and the other plate member functions as the guide plate for guiding the banknotes when the banknotes are sent from the outside to the inside of the banknote storage cassette 30. In addition, a storage space for the banknotes is formed between the placing plate and the guide plate. When the stacking direction of the banknotes stored in the banknote storage cassette 30 is reversed, the functions of the placing plate and the guide plate are interchanged.

[0070] According to the banknote storage cassette 30 of the present embodiment, as described above, the banknotes stored inside the banknote storage cassette 30 by one storage/feeding mechanism of the first storage/feeding mechanism 32 and the second storage/feeding mechanism 42 can be fed out to the outside

of the banknote storage cassette 30 by the other storage/feeding mechanism.

[0071] According to the banknote storage cassette 30 of the present embodiment, as described above, two handles 31a and 31b are provided as gripping units for gripping the banknote storage cassette 30 respectively at positions on the opposite side in the banknote stacking direction in the storage unit (that is, in the vertical direction in FIG. 7) (see FIG. 1). In this case, if the banknote storage cassette 30 is turned upside down, the operator can have the opposite handle.

[0072] According to the banknote storage cassette 30 of the present embodiment, as described above, two connectors 66, 68 for receiving the electric power from the external device such as the banknote settlement device 12 and the banknote teller device 22 are provided at positions on the opposite side in the banknote stacking direction in the storage unit (in the vertical direction in FIG. 7). In this case, even when the banknote storage cassette 30 according to the present embodiment is mounted on the external device such as the banknote settlement device 12 or the banknote teller device 22 in the upside down state, the opposite connector of the pair of connectors 66, 68 is connected to the external device. Therefore, the banknote storage cassette 30 can receive the electric power from the external device. In addition, since the controlling unit 190 of the cash settlement device 11 and the controlling unit 290 of the cash teller device 21 can determine which one of the first storage/feeding mechanism 32 and the second storage/feeding mechanism 42 in the banknote storage cassette 30 should be operated, by detecting which connector 66, 68 is connected to the external device such as the banknote settlement device 12 or the banknote teller device 22.

[0073] According to the banknote storage cassette 30 of the present embodiment, as described above, in the first storage/feeding mechanism 32 and the second storage/feeding mechanism 42, the configuration of the feeding member for feeding out the banknotes stored in the storage unit one by one to the outside of the storage unit are different from each other. More specifically, the endless belts 34 are provided as the feeding member in the first storage/feeding mechanism 32 that feeds the banknotes along their longitudinal direction. In addition, the feed rollers 45 are provided as the feeding member in the second storage/feeding mechanism 42 that feeds the banknotes along their short edge direction. In this case, since a belt, not a roller, is used to feed the banknotes along their longitudinal direction, it is possible to surely feed out the banknotes from the inside of the housing 31 to the outside. It should be noted that, even when a plurality of rollers provided side by side are used to feed the banknotes along the longitudinal direction thereof, as in the case of using the belt, the banknotes can be reliably fed out from the inside of the housing 31 to the outside.

[0074] According to the banknote storage cassette 30 of the present embodiment, as described above, a memory unit 90 for storing the storage order of each of the

banknotes stored in the storage unit in association with the serial number of each of the banknotes is provided. Thus, when the banknote storage cassette 30 delivers the banknotes between the banknote settlement device 12 and the banknote teller device 22, the information on the storage order and serial number of each of the banknotes stored in the banknote storage cassette 30 from the banknote settlement device 12 can be acquired from the memory unit 90 of the banknote storage cassette 30 by the controlling unit 290 of the banknote teller device 22.

[0075] In the present embodiment, as described above, the controlling unit 190 of the banknote settlement device 12 and the controlling unit 290 of the banknote teller device 22 determine the order of banknotes sent from the banknote storage cassette 30 to the main body of the banknote settlement device 12 or the banknote teller device 22, based on the type of the storage/feeding mechanism used in the banknote storage cassette 30 mounted on these banknote settlement device 12 and banknote teller device 22. As a result, the second storage/feeding mechanism 42 is used when the banknote storage cassette 30 is mounted on the banknote teller device 22. In this case, even if such the second storage/feeding mechanism 42 is different from the first storage/feeding mechanism 32 used when the banknotes are stored in the banknote storage cassette 30, the order in which the banknotes are stored in the banknote storage cassette 30 in the banknote settlement device 12 and the order in which banknotes are fed out from the banknote storage cassette 30 in the banknote teller device 22 are set to be the same. As a result, the controlling unit 190 of the banknote settlement device 12 and the controlling unit 290 of the banknote teller device 22 can manage the order of the banknotes sent from the banknote storage cassette 30 to the main body of the banknote settlement device 12 and banknote teller device 22 without error.

[0076] In the banknote teller device 22 of the present embodiment, the banknote storage cassette 30 mounted on the cassette mounting unit 260 can be used to carry out a banknote reconciliation process. Details of the banknote reconciliation process performed in the banknote teller device 22 will be described below.

[0077] In carrying out the banknote reconciliation process in the banknote teller device 22, the banknote storage cassette 30 is first mounted on the cassette mounting unit 260. Then, the banknotes are fed out one by one from a certain storage/feeding unit 250 among the plurality of storage/feeding units 250, and the fed banknotes are sent to the banknote storage cassette 30 by the transporting unit 230 and stored in the banknote storage cassette 30. At this time, the banknote fed out from the storage/feeding unit 250 to the transporting unit 230 is sent to the recognition unit 240 through the first connecting path 232 connecting the upper assembly 202 and the lower assembly 204 of the banknote teller device 22, and the banknote is recognized by the recognition unit 240.

Then, the banknote recognized by the recognition unit 240 is sent to the banknote storage cassette 30 through the second connecting path 234 connecting the upper assembly 202 and lower assembly 204 of the banknote teller device 22, and is stored in the banknote storage cassette 30. In this manner, by providing two connecting paths including the first connecting path 232 and the second connecting path 234 as the connecting path connecting the upper assembly 202 and the lower assembly 204 of the banknote teller device 22, the banknotes can be fed one by one from the storage/feeding unit 250 to the transporting unit 230, and the fed banknotes can be sent to the banknote storage cassette 30 one after another after passing through the recognition unit 240 by the transporting unit 230.

[0078] When all the banknotes are fed out from the storage/feeding unit 250 and stored in the banknote storage cassette 30, the banknotes are fed out one by one from the banknote storage cassette 30, and the fed banknotes are recognized by the recognition unit 240 and then returned to the original storage/feeding unit 250 by the transporting unit 230. At this time, the banknote fed out from the banknote storage cassette 30 to the transporting unit 230 is sent to the recognition unit 240 through the second connecting path 234, and then recognized by the recognition unit 240. Then, the banknote recognized by the recognition unit 240 is sent to the original storage/feeding unit 250 through the first connecting path 232 and stored in original the storage/feeding unit 250. In the case where the recognition result by the recognition unit 240 when the banknotes are sent from the storage/feeding unit 250 to the banknote storage cassette 30 matches the recognition result by the recognition unit 240 when the banknotes are returned from the banknote storage cassette 30 to the storage/feeding unit 250, the banknote reconciliation process in the storage/feeding unit 250 ends normally. When the recognition results of the two do not match, information indicating that the recognition results of both do not match is output from the controlling unit 290, and then this information is displayed in the operation/display unit 295 and/or this information is transmitted to the external device such as a host terminal by the interface 297. Such processing is performed for each storage/feeding unit 250 (that is, for each denomination) in all storage/feeding units 250. In this way, it is possible to confirm the inventory of the banknotes stored in each storage/feeding unit 250. Such the reconciliation process of the banknotes is performed by controlling each storage/feeding unit 250, the banknote storage cassette 30 mounted on the cassette mounting unit 260, the transporting unit 230 and the like by the controlling unit 290 of the banknote teller device 22. When using the banknote storage cassette 30 mounted on the cassette mounting unit 260 to perform the banknote reconciliation process in the banknote teller device 22, the storage/feeding unit 250 may be of the stacker type in which the banknotes are stored in a stacked state, not the tape-reel type in which the banknotes are sandwiched be-

tween the pair of tapes and the tapes are wound together with banknotes.

[0079] As a configuration of the banknote storage cassette according to the present embodiment, instead of using the banknote storage cassette 30 having the configuration as shown in FIGS. 7 to 11, a banknote storage cassette 30a having a configuration as shown in FIGS. 12 to 14 may be used. In the banknote storage cassette 30a shown in FIGS. 12 to 14, a regulating member 70 for regulating the position of the banknotes sent from the transporting unit 230 to the banknote storage cassette 30a and stored in the banknote storage cassette 30a when the reconciliation process of the banknotes is performed, and a driving member 72 for moving the regulating member 70 are provided. In the present embodiment, the controlling unit 290 of the banknote teller device 22 controls the driving member 72 to change the position of the regulating member 70 based on the denomination of the banknotes on which the reconciliation process is performed. More specifically, in the memory unit 296 of the banknote teller device 22, information relating to the position of the regulating member 70 corresponding to each denomination of the banknotes is stored. The controlling unit 290 controls the driving member 72 to move the regulating member 70 to the position corresponding to the denomination of the banknotes on which the reconciliation process is performed, which is stored in the memory unit 296. Technical features of the banknote storage cassette 30a will be described in detail below.

[0080] As shown in FIGS. 12 to 14, the regulating member 70 is composed of a side plate forming a storage space for the banknotes in the banknote storage cassette 30a. The storage space of the banknotes in the banknote storage cassette 30a is partitioned by the regulating member 70 as the side plate. As shown in FIG. 12, the regulating member 70 is movable in a direction toward the inlet/outlet opening 48 of the banknote storage cassette 30a and in a direction away from the inlet/outlet opening 48. The driving member 72 is composed of, for example, an electric actuator and the like, and the driving member 72 can move the regulating member 70 in the direction of the arrow in FIG. 12. The driving member 72 is not limited to the electric actuator, and other driving mechanisms such as a pantograph mechanism and a rack and pinion mechanism may be used. In the present embodiment, the power of the driving member 72 is supplied from the main body of the banknote teller device 22. More specifically, connectors similar to the connectors 66 and 68 of the banknote storage cassette 30 shown in FIG. 7 are provided near the upper end and the lower end on the side surface of the housing 31 of the banknote storage cassette 30a, respectively. When the banknote storage cassette 30a is mounted on the cassette mounting unit 260 of the banknote teller device 22 and the main body connector of the banknote teller device 22 and the connector of the banknote storage cassette 30a are connected, the electric power is supplied from the banknote teller device 22 to the banknote storage cassette 30a,

and the driving member 72 is driven by the supplied electric power.

[0081] In the memory unit 296 of the banknote teller device 22, for example, two or three positions are stored as the position of the regulating member 70, and one or more denominations of the banknotes are associated with each position. Specifically, a first position of the regulating member 70 is shown in FIG. 13 and a second position of the regulating member 70 is shown in FIG. 14. When the number of the positions of the regulating member 70 stored in the memory unit 296 is two, the first position as shown in FIG. 13 and the second position as shown in FIG. 14 are used. In the case where the number of the positions of the regulating member 70 stored in the memory unit 296 is three, in addition to the first position as shown in FIG. 13 and the second position as shown in FIG. 14, a third position located between the first position and the second position is used. In addition, each denomination of the banknotes is associated with any one of these first position, second position, third position, and the like. Specifically, the denomination of the banknotes having relatively large size is associated with the first position as shown in FIG. 13, and the denomination of the banknotes having relatively small size is associated with the second position as shown in FIG. 14. Then, the regulating member 70 is moved to the respective positions such as the first position, the second position, the third position, and the like by the driving member 72. More specifically, the driving member 72 is controlled by the controlling unit 290 so that the regulating member 70 moves to the position corresponding to the denomination of the banknotes on which the reconciliation process is performed, among the first position, the second position, and the third position.

[0082] As shown in FIGS. 12 to 14, a plurality of detecting sensors 71a and 71b for detecting the regulating member 70 located at the first position, the second position and the like are provided inside the banknote storage cassette 30a. The first detecting sensor 71a detects the regulating member 70 when the regulating member 70 is located at the first position as shown in FIG. 13. The second detecting sensor 71b detects the regulating member 70 when the regulating member 70 is located at the second position as shown in FIG. 14. If the regulating member 70 moves to the third position located between the first position and the second position, a third detecting sensor (not shown) for detecting the regulating member 70 located at the third position is installed. In this embodiment, one or a plurality of denominations of the banknotes are associated with each of the detecting sensors 71a, 71b. Thus, the controlling unit 290 controls the driving member 72 to move the regulating member 70 to the position detected by the detecting sensor corresponding to the denomination of the banknotes to be subjected to the reconciliation process among the plurality of detecting sensors 71a and 71b.

[0083] Next, the operation when the banknote storage cassette 30a is mounted on the cassette mounting unit

260 and the reconciliation process of the banknotes is performed will be described below. When the reconciliation process is performed on the storage/feeding unit 250 corresponding to the denomination of the banknotes having relatively large size among the plurality of storage/feeding units 250, the regulating member 70 is moved by the driving member 72 to the first position as shown in FIG. 13, for example, before the banknotes are fed out from this storage/feeding unit 250. Thereafter, the banknotes fed out from the storage/feeding unit 250 are sent to the banknote storage cassette 30a by the transporting unit 230 and stored in the banknote storage cassette 30a. At this time, since the regulating member 70 is moved to the position relatively far from the inlet/outlet opening 48, the banknotes having large size can also be stored in the banknote storage cassette 30a. Such the banknotes having large size are denoted by P1 in FIG. 13. When the reconciliation process is performed on the storage/feeding unit 250 corresponding to the denomination of the banknotes having a relatively small size among the plurality of storage/feeding units 250, the regulating member 70 is moved by the driving member 72 to the second position as shown in FIG. 14, for example, before the banknotes are fed out from this storage/feeding unit 250. Thereafter, the banknotes fed out from the storage/feeding unit 250 are sent to the banknote storage cassette 30a by the transporting unit 230 and stored in the banknote storage cassette 30a. At this time, since the regulating member 70 is moved to the position relatively close to the inlet/outlet opening 48, it is possible to prevent the stacking position of the banknotes from deviating in the lateral direction in FIG. 14 when the banknotes with small size are stacked in the banknote storage cassette 30a. Such the banknotes having small size are denoted by P2 in Fig. 14.

[0084] According to the banknote storage cassette 30a of the present embodiment having the above configuration and the banknote teller device 22 using the banknote storage cassette 30a, the banknote storage cassette 30a is provided with the regulating member 70 for regulating the position of the banknotes sent from the transporting unit 230 to the banknote storage cassette 30a and stored in the banknote storage cassette 30a, and the driving member 72 for moving the regulating member 70. In addition, the controlling unit 290 controls the driving member 72 so as to change the position of the regulating member 70 based on the denomination of the banknotes on which the stock reconciliation process is performed. In this way, by changing the position of the regulating member 70 based on the denomination of the banknotes on which the stock reconciliation process is performed, even if the stock reconciliation process is performed on the banknotes with small size of the denomination thereof, when the banknotes are stacked in the banknote storage cassette 30a, it can be prevented that the stacking position of the banknotes deviates in the lateral direction in FIG. 14. Accordingly, it is possible to prevent the banknotes stored in the banknote storage cassette 30a from

being inclined with respect to a predetermined direction. Therefore, troubles such as jamming of the banknotes can be prevented.

[0085] In the banknote teller device 22 of the present embodiment, as described above, the memory unit 296 stores information on the positions of the regulating member 70 corresponding to each denomination of the banknotes. The controlling unit 290 controls the driving member 72 to move the regulating member 70 to the position corresponding to the denomination of the banknotes on which the stock reconciliation process is performed, which is stored in the memory unit 296. In addition, a plurality of detecting sensors 71a and 71b are provided as detecting units for detecting the position of the regulating member 70, and one or more denominations of the banknotes are associated with each detecting sensor 71a and 71b. Then, the controlling unit 290 controls the driving member 72 to move the regulating member 70 to the position to be detected by the detecting sensors 71a and 71b corresponding to the denomination of the banknotes on which the stock reconciliation process is performed.

[0086] In the banknote teller device 22 of the present embodiment, as described above, the regulating member 70 provided in the banknote storage cassette 30a includes the side plate forming the storage space for the banknotes in the banknote storage cassette 30a.

[0087] In the banknote teller device 22 of this embodiment, as described above, the banknote storage cassette 30a can be attached to and detached from the main body of the banknote teller device 22, and the driving force of the driving member 72 provided in the banknote storage cassette 30a is supplied from the main body of the banknote teller device 22.

[0088] Note that the banknote storage cassette, the banknote teller device, and the cash management system according to the present embodiment are not limited to the above-described aspects, and various modifications can be made.

[0089] For example, in the banknote settlement device 12, instead of mounting the banknote storage cassette 30 on the cassette mounting unit 160 or in addition to mounting the banknote storage cassette 30 on the cassette mounting unit 160, the banknote storage cassette 30 may be mounted on the receiving unit 110. In this case, the banknotes can be fed out from the banknote storage cassette 30 mounted on the receiving unit 110 to the transporting unit 130, and the banknotes can be sent from the transporting unit 130 to the banknote storage cassette 30 mounted on the receiving unit 110. In addition, a reader/writer (not shown) may be provided in the receiving unit 110. The reader/writer provided in the receiving unit 110 writes information in the memory unit 90 of the banknote storage cassette 30 or reads information from the memory unit 90 when the banknote storage cassette 30 is mounted on the receiving unit 110. In this case, when the banknote storage cassette 30 is mounted on the receiving unit 110, the information stored

in the memory unit 90 can be read by the reader/writer provided in the receiving unit 110. In addition, when the banknotes are fed out from the banknote storage cassette 30 mounted on the receiving unit 110 into the housing 100 and stored in the storage/feeding unit 150, the banknotes fed out from the banknote storage cassette 30 may be stored in each storage/feeding unit 150, depending on the information acquired from the memory unit 90 by the reader/writer provided in the receiving unit 110. When the banknote fed into the housing 100 from the banknote storage cassette 30 mounted on the receiving unit 110 is recognized by the recognition unit 140, the banknote that is recognized as not being the normal banknote or the banknote that is recognized as the transport error is stored as the reject banknote in a collection unit (not shown).

[0090] A banknote storage cassette 30b having a configuration as shown in FIG. 15 may be used instead of the banknote storage cassette 30a configured as shown in FIGS. 12 to 14 in the banknote teller device 22 in which the reconciliation process of the banknotes is performed. In the banknote storage cassette 30b shown in FIG. 15, a regulating member 74 composed of a stopper against which the banknote sent from the transporting unit 230 of the banknote teller device 22 to the banknote storage cassette 30b collides is used, instead of the regulating member 70 as the side plate forming the storage space for the banknotes in the banknote storage cassette 30a. The banknote collided with the regulating member 74 composed of the stopper is stored in the storage space for the banknotes in the banknote storage cassette 30b. Details of the configuration of such the banknote storage cassette 30b will be described with reference to FIG. 15.

[0091] As shown in FIG. 15, the regulating member 74, composed of the stopper against which the banknote sent from the transporting unit 230 of the banknote teller device 22 to the banknote storage cassette 30b collides, is movable in a direction toward the inlet/outlet opening 48 of the banknote storage cassette 30b and in a direction away from the inlet/outlet opening 48. As shown in FIG. 15, in the banknote storage cassette 30b, a driving member 76 for moving the regulating member 74 is provided. The driving member 76 is constituted by, for example, an electric actuator and the like, and the driving member 76 can move the regulating member 74 in the direction of the arrow in FIG. 15. In the banknote storage cassette 30b shown in FIG. 15, similar to the banknote storage cassette 30a shown in FIGS. 12 to 14, the driving force of the driving member 76 is supplied from the main body of the banknote teller device 22. More specifically, connectors similar to the connectors 66 and 68 of the banknote storage cassette 30 shown in FIG. 7 are provided near the upper end and the lower end on the side surface of the housing 31 of the banknote storage cassette 30b, respectively. When the banknote storage cassette 30b is mounted on the cassette mounting unit 260 of the banknote teller device 22 and the main body connector of the banknote teller device 22 and the connector of the

banknote storage cassette 30b are connected, the driving force is supplied from the banknote teller device 22 to the banknote storage cassette 30b, and the driving member 76 is driven by the supplied driving force.

[0092] In the memory unit 296 of the banknote teller device 22, for example, two or three positions are stored as the position of the regulating member 74, and one or more denominations of the banknotes are associated with each position. Specifically, regarding the denomination of the banknotes having relatively large size, a position relatively far from the banknote inlet/outlet opening 48 is associated with the position of the regulating member 74. Regarding the denomination of the banknotes having relatively small size, a position relatively close to the banknote inlet/outlet opening 48 is associated with the position of the regulating member 74. Then, the regulating member 74 is moved to any one of these plural positions by the driving member 76. More specifically, the driving member 76 is controlled by the controlling unit 290 so that the regulating member 70 moves to the position corresponding to the denomination of the banknotes on which the reconciliation process is performed, among the plurality of positions stored in the memory unit 296.

[0093] In addition, a plurality of detecting sensors (not shown) for detecting the regulating members 74 located at each of the plurality of positions are provided inside the banknote storage cassette 30b. Each detecting sensor is associated with one or more denominations of the banknotes. Thus, the controlling unit 290 controls the driving member 76 to move the regulating member 74 to the position detected by the detecting sensor corresponding to the denomination of the banknotes to be subjected to the reconciliation process among the plurality of detecting sensors.

[0094] Next, the operation when the banknote storage cassette 30b is mounted on the cassette mounting unit 260 and the reconciliation process of the banknotes is performed will be described below. When the reconciliation process is performed on the storage/feeding unit 250 corresponding to the denomination of the banknotes having relatively large size among the plurality of storage/feeding units 250, the regulating member 74 functioning as the stopper is moved by the driving member 76 to the position relatively far from the banknote inlet/outlet opening 48 before the banknotes are fed out from this storage/feeding unit 250. Thereafter, the banknotes fed out from the storage/feeding unit 250 are sent to the banknote storage cassette 30b by the transporting unit 230 and stored in the banknote storage cassette 30b. At this time, since the regulating member 74 is moved to the position relatively far from the inlet/outlet opening 48, the banknotes having large size can also be stored in the banknote storage cassette 30b. When the reconciliation process is performed on the storage/feeding unit 250 corresponding to the denomination of the banknotes having a relatively small size among the plurality of storage/feeding units 250, the regulating member 74 functioning as

the stopper is moved by the driving member 76 to the position relatively close to the inlet/outlet opening 48 before the banknotes are fed out from this storage/feeding unit 250. Thereafter, the banknotes fed out from the storage/feeding unit 250 are sent to the banknote storage cassette 30b by the transporting unit 230 and stored in the banknote storage cassette 30b. At this time, since the regulating member 74 is moved to the position relatively close to the inlet/outlet opening 48, it is possible to prevent the stacking position of the banknotes from deviating in the lateral direction in FIG. 15 when the banknotes having small size are stacked in the banknote storage cassette 30b.

[0095] According to the banknote teller device 22 using the banknote storage cassette 30b shown in FIG. 15, the banknote storage cassette 30b is provided with the regulating member 74 composed of the stopper for regulating the position of the banknotes sent from the transporting unit 230 to the banknote storage cassette 30b and stored in the banknote storage cassette 30b, and the driving member 76 for moving the regulating member 74. In addition, the controlling unit 290 controls the driving member 76 so as to change the position of the regulating member 74 based on the denomination of the banknotes on which the reconciliation process is performed. In this way, by changing the position of the regulating member 74 composed of the stopper based on the denomination of the banknotes on which the reconciliation process is performed, even if the reconciliation process is performed on the banknotes with small size of the denomination thereof, when the banknotes are stacked in the banknote storage cassette 30b, it can be prevented that the stacking position of the banknotes deviates in the lateral direction in FIG. 15. Accordingly, it is possible to prevent the banknotes stored in the banknote storage cassette 30b from being inclined with respect to a predetermined direction. Therefore, troubles such as jamming of the banknotes can be prevented.

[0096] As a banknote storage cassette according to the present invention, a banknote storage cassette, in which a plate member used as a guide plate of a pair of plate members functions as a stacking lever for aligning the banknotes sent from the main body of the banknote settlement device 12 and banknote teller device 22, may be used. A configuration of this banknote storage cassette will be described with reference to FIG. 16.

[0097] In a banknote storage cassette 30c as shown in FIG. 16, the plate member (indicated by reference numeral 50p in FIG. 16) used as the guide plate among the pair of plate members can be inclined obliquely downward with respect to the direction in which the banknotes are sent from the inlet/outlet opening 48 to the inside of the housing 31 (that is, in the left-right direction in FIG. 16). Thus, in the banknote storage cassette 30c, the leading end portion of the banknote sent from the inlet/outlet opening 48 to the inside of the housing 31 contacts a lower surface of the plate member 50p inclined with respect to the feeding direction of the banknote and where-

by the leading end portion of the banknote is guided along the lower surface of the plate member 50p. As a result, the banknote sent from the inlet/outlet opening 48 to the inside of the housing 31 is stacked in an aligned state on the banknotes already stacked in the plate member 52. In this way, since the plate member 50p functioning as the guide plate among the pair of plate members is inclined obliquely downward with respect to the feeding direction of the banknote from the inlet/outlet opening 48 to the inside of the housing 31, the banknote sent from the inlet/outlet opening 48 to the inside of the housing 31 can be smoothly guided by the plate member 50p and stacked on the plate member 52. In the case where the banknote storage cassette 30c shown in FIG. 16 is used upside down, the plate member 50p is maintained in a state of extending in the left-right direction in FIG. 16, so that it is used as the placing plate on which the banknotes are stacked.

[0098] In addition, as a banknote storage cassette in which a plate member used as a guide plate of a pair of plate members functions as a stacking lever, one having a configuration as shown in FIGS. 17 to 19 may be used. In a banknote storage cassette 30d shown in FIGS. 17 to 19, among a pair of plate members, a plate member 51 functioning as a guide plate is divided into two members 51a and 51b. Each of the members 51a and 51b can be inclined obliquely downward with respect to the left-right direction in FIG. 17 independently of each other. The operation when the banknotes are stored in the banknote storage cassette 30d will be described with reference to FIGS. 18 and 19.

[0099] When the banknotes are sent from the inlet/outlet opening 48 to the inside of the housing 31 in the banknote storage cassette 30d shown in FIG. 17, the member 51a on the side farther from the inlet/outlet opening 48 among the two members 51a and 51b is inclined obliquely downward with respect to the left-right direction in FIG. 17 (see FIG. 18). As a result, the leading end portion of the banknote sent from the inlet/outlet opening 48 to the inside of the housing 31 comes into contact with a lower surface of the member 51a which is inclined with respect to the feeding direction of the banknote, and the leading end portion of the banknote is guided along the lower surface of the member 51a. Thereafter, the member 51b of the two members 51a, 51b closer to the inlet/outlet opening 48 is inclined obliquely downward with respect to the left-right direction in FIG. 17 (see FIG. 19). This causes the surface of the banknote sent from the inlet/outlet opening 48 to the inside of the housing 31 to be pressed downward by the member 51b so that this banknote is stacked in an aligned state on the banknotes already stacked in the plate member 52. In this way, since each member 51a, 51b of the plate member 51 functioning as the guide plate among the pair of plate members is inclined obliquely downward with respect to the feeding direction of the banknote from the inlet/outlet opening 48 to the inside of the housing 31, the banknote sent from the inlet/outlet opening 48 to the inside of the housing 31

can be smoothly guided by the plate member 51 and stacked on the plate member 52. In the case where the banknote storage cassette 30d shown in FIG. 17 and the like is used upside down, each member 51a, 51b of the plate member 51 is maintained in a state of extending in the left-right direction in FIG. 17, so that it is used as the placing plate on which the banknotes are stacked.

[0100] As a banknote storage cassette having still another configuration, a banknote storage cassette 30e in which four plate members 80, 82, 84, 86 are provided in the housing 31 as shown in FIG. 20 may be used. In the banknote storage cassette 30e as shown in FIG. 20, each plate member 80, 82, 84, 86 can move independently in the vertical direction in FIG. 20. The banknotes put into the housing 31 by the inlet/outlet opening 38 are stored in the housing 31 in a state sandwiched between the pair of plate members 84, 86. The banknotes put into the housing 31 by the inlet/outlet opening 48 are stored in the housing 31 in a state sandwiched between the pair of plate members 80, 82. According to the banknote storage cassette 30e, when collecting the banknotes from the banknote settlement device 12 and the banknote teller device 22, one banknote storage cassette 30e can collect the banknotes from both banknote settlement device 12 and banknote teller device 22. Specifically, in the case of collecting the banknotes from the banknote settlement device 12, the banknote storage cassette 30e is turned upside down from the state shown in FIG. 20 and mounted on the cassette mounting unit 160 of the banknote settlement device 12. Then, when the banknotes fed out from each storage/feeding unit 150 in the banknote settlement device 12 are sent to the banknote storage cassette 30e by the transporting unit 130, the banknotes sent to the inside of the housing 31 via the inlet/outlet opening 38 are sent to a space between the pair of plate members 84 and 86 by each endless belt 34 of the first storage/feeding mechanism 32, and stored in the space between the pair of plate members 84 and 86. In addition, when collecting the banknotes from the banknote teller device 22, the banknote storage cassette 30e is mounted on the cassette mounting unit 260 of the banknote teller device 22 in the state shown in FIG. 20. Then, when the banknotes fed out from each storage/feeding unit 250 in the banknote teller device 22 are sent to the banknote storage cassette 30e by the transporting unit 230, the banknotes sent to the inside of the housing 31 via the inlet/outlet opening 48 are sent to a space between the pair of plate members 80 and 82 by the feed rollers 45 of the second storage/feeding mechanism 42, and stored in the space between the pair of plate members 80 and 82.

[0101] When the banknote storage cassette 30e is removed from the cassette mounting unit 160 of the banknote settlement device 12 after the banknote storage cassette 30e stores the banknotes in the banknote settlement device 12, the plate members 84 and 86 move in a direction away from the inlet/outlet opening 38 in a state where the banknotes are interposed therebetween.

In addition, when the banknote storage cassette 30e is removed from the cassette mounting unit 260 of the banknote teller device 22 after the banknote storage cassette 30e stores the banknotes in the banknote teller device 22, the plate members 80 and 82 move in a direction away from the inlet/outlet opening 48 in a state where the banknotes are interposed therebetween. Here, the plate members 82, 84 moved in the directions away from the inlet/outlet opening 38, 48 may overlap each other. As a result, when carrying the banknote storage cassette 30e taken out from the banknote settlement device 12 and the banknote teller device 22, it is possible to prevent the banknotes stored in the banknote storage cassette 30e from being pulled out from the respective inlet/outlet openings 38 and 48, thereby improving the anti-theft property of the banknote storage cassette 30e.

[0102] When the reconciliation process is performed in the banknote teller device 22 of the present embodiment, the banknotes may be sent from one storage/feeding unit 250 to another storage/feeding unit 250 and then the banknotes may be returned to the original storage/feeding unit 250 from another storage/feeding unit 250, instead of sending the banknotes from each storage/feeding unit 250 to the banknote storage cassette 30a and the like and then returning the banknotes from the banknote storage cassette 30a and the like to each storage/feeding unit 250. In this case, in the storage/feeding unit 250 where the banknotes are temporarily held when the reconciliation process is performed, a regulating member for regulating the position of the banknotes sent from the transporting unit 230 to the storage/feeding unit 250 and stored in the storage/feeding unit 250 and a driving member for moving the regulating member may be provided. In this case, the controlling unit 290 controls the driving member to change the position of the regulating member provided in the storage/feeding unit 250 based on the denomination of the banknotes on which the reconciliation process is performed. More specifically, the regulating member and the driving member having the same configuration as the regulating member 70 and the driving member 72 in the banknote storage cassette 30a shown in FIGS. 12 to 14 may be provided in the storage/feeding unit 250. Alternatively, the regulating member and the driving member having the same configuration as the regulating member 74 and the driving member 76 in the banknote storage cassette 30b shown in FIG. 15 may be provided in the storage/feeding unit 250. In this way, when changing the position of the regulating member provided in the storage/feeding unit 250 where the banknotes are temporarily held when the reconciliation process is performed based on the denomination of the banknotes on which the reconciliation process is performed, even if the reconciliation process is performed on the banknotes with small size of the denomination thereof, when the banknotes are stacked in the storage/feeding unit 250, it can be prevented that the stacking position of the banknotes deviates. Accordingly, it is possible to prevent the banknotes stored in the stor-

age/feeding unit 250 from being inclined with respect to a predetermined direction. Therefore, troubles such as jamming of the banknotes can be prevented.

[0103] In the banknote teller device 22 of the present embodiment, a storage/feeding unit dedicated for the reconciliation process may be provided. In this case, when the reconciliation process is performed, the banknotes are sent from each storage/feeding unit 250 to the storage/feeding unit dedicated for the reconciliation process, and then the banknotes are returned from the storage/feeding unit dedicated for the reconciliation process to each storage/feeding unit 250. Also in this case, in the storage/feeding unit dedicated for the reconciliation process in which the banknotes are temporarily held when the reconciliation process is performed, a regulating member for regulating the position of the banknotes sent from the transporting unit 230 to the storage/feeding unit and stored in the storage/feeding unit and a driving member for moving the regulating member may be provided. In this case, the controlling unit 290 controls the driving member to change the position of the regulating member provided in the storage/feeding unit dedicated for the reconciliation process, based on the denomination of the banknotes on which the reconciliation process is performed.

[0104] When the reconciliation process is performed in the banknote teller device 22 of the present embodiment, if the banknotes are temporarily held in one storage/feeding unit 250 among the plurality of storage/feeding units 250 or the storage/feeding unit dedicated for the reconciliation process, the storage/feeding unit that holds the banknotes temporarily may be provided with a width position aligning mechanism for hitting the side edge portion of the banknote sent from the transporting unit 230 so as to align the banknote at the central position in the width direction. In this case, even when the reconciliation process of the banknotes with small size of the denomination thereof is performed, it is possible to prevent the position where the banknotes are stacked from deviating in the width direction when the banknotes are stacked in the storage/feeding unit 250.

Claims

1. A banknote handling device comprising:

an upper assembly (202),
a lower assembly (204) configured to include plurality of storage/feeding units (250),
each of the storage/feeding units (250) capable of storing banknotes for each denomination and feeding out the stored banknotes;
a transporting unit (230) configured to transport the banknotes between the storage/feeding units (250);
a memory unit (296) configured to store information on a position of a regulating member (70,

74) corresponding to each denomination of the banknotes; and

a controlling unit (290) configured to control the storage/feeding units (250) and the transporting unit (230) for performing the stock reconciliation process in which the banknotes are fed out from a first storage/feeding unit of the plurality of storage/feeding units (250) and sent to a second storage/feeding unit of the plurality of storage/feeding units (250) by the transporting unit (230), then the banknotes are returned to the first storage/feeding unit (250) from the second storage/feeding unit (250) by the transporting unit (230);

characterized in that

the regulating member (70, 74) is configured to regulate a position of the banknotes stored in the second storage/feeding unit (250) after being sent from the transporting unit (230), and a driving member (72, 76) configured to move the regulating member (70, 74) are provided in the second storage/feeding unit (250), and the controlling unit (290) is configured to control the driving member (72, 76) to move the regulating member (70, 74) to the position stored in the memory unit (296) corresponding to the denomination of the banknotes on which the stock reconciliation process is performed.

2. The banknote handling device as claimed in claim 1, characterized in that

a plurality of detecting units (71a, 71b) configured to detect the position of the regulating member (70, 74) are provided, each detecting unit (71a, 71b) being associated with one or more denominations of the banknotes, and the controlling unit (290) is configured to control the driving member (72, 76) to move the regulating member (70, 74) to the position to be detected by the detecting unit (71a, 71b) corresponding to the denomination of the banknote on which the stock reconciliation process is performed.

3. The banknote handling device as claimed in claim 1 or 2, characterized in that the regulating member (70) provided in the second storage/feeding unit (250) is composed of a side plate forming a storage space of the banknotes in the second storage/feeding unit (250).

4. The banknote handling device as claimed in claims 1 or 2, characterized in that the regulating member (74) provided in the second storage/feeding unit (250) is composed of a stopper against which the banknotes sent from the transporting unit (230) to the second storage/feeding unit (250) collides, and

the banknotes collided with the stopper is stored in a storage space of the banknotes in the second storage/feeding unit (250).

5. The banknote handling device as claimed in any one of claims 1 to 4, **characterized in that** the second storage/feeding unit (250) is composed of a banknotes storage cassette (250) that is capable of being mounted on a main body of the banknote handling device (22), and a driving force of the driving member (72, 76) is supplied from the main body of the banknote handling device (22). 5
 6. A method of performing a stock reconciliation process of banknotes in a banknote handling device as claimed in any one of claims 1 to 5, the method comprising: 10
- moving the regulating member (70, 74) for regulating a position of the banknotes stored in the second storage/feeding unit (250) by the driving member (72, 76) to the position stored in the memory unit (296) corresponding to the denomination of the banknotes on which the stock reconciliation process is performed; 20
- performing the stock reconciliation process in which the banknotes are fed out from the first storage/feeding unit (250) and sent to the second storage/feeding unit (250) by the transporting unit (230), then the banknotes are fed out from the second storage/feeding unit (250) and returned to the first storage/feeding unit (250) by the transporting unit (230). 25 30

Patentansprüche

1. Vorrichtung zur Handhabung von Banknoten, umfassend: 35
- eine obere Baugruppe (202), 40
- eine untere Baugruppe (204), die so konfiguriert ist, dass sie eine Vielzahl von Speicher-/Zuführeinheiten (250) enthält,
- wobei jede der Speicher-/Zuführeinheiten (250) in der Lage ist, Banknoten für jede Stückelung zu speichern und die gespeicherten Banknoten auszugeben; 45
- eine Transporteinheit (230), die so konfiguriert ist, dass sie die Banknoten zwischen den Speicher-/Zuführeinheiten (250) transportiert; 50
- eine Speichereinheit (296), die so konfiguriert ist, dass sie Informationen über eine Position eines Regulierungsglieds (70, 74) entsprechend jeder Stückelung der Banknoten speichert; und 55
- eine Steuereinheit (290), die so konfiguriert ist, dass sie die Speicher-/Zuführeinheiten (250)

und die Transporteinheit (230) steuert, um den Bestandsabgleichsprozess durchzuführen, bei dem die Banknoten aus einer ersten Speicher-/Zuführeinheit der Vielzahl von Speicher-/Zuführeinheiten (250) herausgeführt und durch die Transporteinheit (230) zu einer zweiten Speicher-/Zuführeinheit der Vielzahl von Speicher-/Zuführeinheiten (250) geschickt werden und dann die Banknoten von der zweiten Lagerungs-/Zuführungseinheit (250) durch die Transporteinheit (230) an die erste Lagerungs-/Zuführungseinheit (250) zurückgegeben werden;

dadurch gekennzeichnet, dass

das Regulierungsglied (70, 74) so konfiguriert ist, dass es eine Position der in der zweiten Speicher-/Zuführeinheit (250) gespeicherten Banknoten reguliert, nachdem sie von der Transporteinheit (230) gesendet wurden, und ein Antriebsglied (72, 76), das so konfiguriert ist, dass es das Regulierungsglied (70, 74) bewegt, in der zweiten Speicher-/Zuführeinheit (250) vorgesehen ist, und

die Steuereinheit (290) so konfiguriert ist, dass sie das Antriebsglied (72, 76) steuert, um das Regulierelement (70, 74) in die in der Speichereinheit (296) gespeicherte Position zu bewegen, die dem Nennwert der Banknoten entspricht, an denen der Bestandsabgleichsvorgang durchgeführt wird.

2. Banknotenbearbeitungsvorrichtung wie in Anspruch 1 beansprucht, **dadurch gekennzeichnet, dass**

eine Vielzahl von Erfassungseinheiten (71a, 71b) vorgesehen sind, die so konfiguriert sind, dass sie die Position des Regulierungsglieds (70, 74) erfassen, wobei jede Erfassungseinheit (71a, 71b) einem oder mehreren Nennwerten der Banknoten zugeordnet ist, und 35

die Steuereinheit (290) so konfiguriert ist, dass sie das Antriebsglied (72, 76) steuert, um das Regulierelement (70, 74) in die von der Erfassungseinheit (71a, 71b) zu erfassende Position zu bewegen, die dem Nennwert der Banknote entspricht, an der der Bestandsabgleichsvorgang durchgeführt wird. 40

3. Banknotenbearbeitungsvorrichtung wie in Anspruch 1 oder 2 beansprucht, **dadurch gekennzeichnet, dass** das in der zweiten Speicher-/Zuführeinheit (250) vorgesehene Regulierungsglied (70) aus einer Seitenplatte besteht, die einen Speicherraum für die Banknoten in der zweiten Speicher-/Zuführeinheit (250) bildet. 45
4. Banknotenbearbeitungsvorrichtung wie in Anspruch 1 oder 2 beansprucht, **dadurch gekennzeichnet,**

dass das in der zweiten Speicher-/Zuführeinheit (250) vorgesehene Regulierungsglied (74) aus einem Stopper besteht, gegen den die von der Transporteinheit (230) zur zweiten Speicher-/Zuführeinheit (250) gesendeten Banknoten prallen, und dass die auf den Stopper geprallten Banknoten in einem Speicherraum der Banknoten in der zweiten Speicher-/Zuführeinheit (250) gespeichert werden.

5. Banknotenbearbeitungsgerät wie in einem der Ansprüche 1 bis 4 beansprucht, **dadurch gekennzeichnet, dass**

die zweite Speicher-/Zuführeinheit (250) aus einer Banknotenspeicherkassette (250) besteht, die an einem Hauptkörper der Banknotenbearbeitungsvorrichtung (22) angebracht werden kann, und eine Antriebskraft des Antriebsglieds (72, 76) von dem Hauptkörper der Banknotenbearbeitungsvorrichtung (22) zugeführt wird.

6. Verfahren zur Durchführung eines Bestandsabgleichs von Banknoten in einer wie in einem der Ansprüche 1 bis 5 beanspruchten Banknotenbearbeitungsvorrichtung, wobei das Verfahren umfasst:

Bewegen des Regulierungsglieds (70, 74) zum Regulieren einer Position der in der zweiten Speicher-/Zuführeinheit (250) gespeicherten Banknoten durch das Antriebsglied (72, 76) zu der in der Speichereinheit (296) gespeicherten Position, die dem Nennwert der Banknoten entspricht, an denen der Bestandsabgleichsvorgang durchgeführt wird;

Durchführen des Bestandsabgleichsprozesses, bei dem die Banknoten aus der ersten Speicher-/Zuführeinheit (250) herausgeführt und durch die Transporteinheit (230) zur zweiten Speicher-/Zuführeinheit (250) geschickt werden und dann die Banknoten aus der zweiten Speicher-/Zuführeinheit (250) herausgeführt und durch die Transporteinheit (230) zur ersten Speicher-/Zuführeinheit (250) zurückgeführt werden.

Revendications

1. Dispositif de traitement de billets de banque comprenant :

un ensemble supérieur (202),
un ensemble inférieur (204) configuré pour inclure une pluralité d'unités de stockage/d'alimentation (250),
chacune des unités de stockage/d'alimentation (250) étant capable de stocker des billets de banque pour chaque coupure et d'alimenter les billets de banque stockés ;

une unité de transport (230) configurée pour transporter les billets de banque entre les unités de stockage/d'alimentation (250) ;

une unité de mémoire (296) configurée pour stocker des informations sur une position d'un élément de régulation (70, 74) correspondant à chaque coupure des billets de banque ; et une unité de commande (290) configurée pour commander les unités de stockage/d'alimentation (250) et l'unité de transport (230) afin d'exécuter le processus de rapprochement de stocks dans lequel les billets de banque sont alimentés à partir d'une première unité de stockage/d'alimentation de la pluralité d'unités de stockage/d'alimentation (250) et envoyés à une deuxième unité de stockage/d'alimentation de la pluralité d'unités de stockage/d'alimentation (250) par l'unité de transport (230), les billets de banque sont ensuite renvoyés à la première unité de stockage/d'alimentation (250) à partir de la deuxième unité de stockage/d'alimentation (250) par l'unité de transport (230) ;

caractérisé en ce que

l'élément de régulation (70, 74) est configuré pour réguler une position des billets de banque stockés dans la deuxième unité de stockage/d'alimentation (250) après avoir été envoyés à partir de l'unité de transport (230), et un élément d'entraînement (72, 76) configuré pour déplacer l'élément de régulation (70, 74) est prévu dans la deuxième unité de stockage/d'alimentation (250), et

l'unité de commande (290) est configurée pour commander l'élément d'entraînement (72, 76) pour déplacer l'élément de régulation (70, 74) vers la position stockée dans l'unité de mémoire (296) correspondant à la coupure des billets de banque sur lesquels le processus de rapprochement de stocks est exécuté.

2. Dispositif de traitement de billets de banque selon la revendication 1, **caractérisé en ce que**

une pluralité d'unités de détection (71a, 71b) configurées pour détecter la position de l'élément de régulation (70, 74) sont prévues, chaque unité de détection (71a, 71b) étant associée à une ou plusieurs coupures des billets de banque, et

l'unité de commande (290) est configurée pour commander l'élément d'entraînement (72, 76) pour déplacer l'élément de régulation (70, 74) vers la position à détecter par l'unité de détection (71a, 71b) correspondant à la coupure du billet de banque sur lequel le processus de rapprochement de stocks est exécuté.

3. Dispositif de traitement de billets de banque selon

la revendication 1 ou 2, **caractérisé en ce que** l'élément de régulation (70) prévu dans la deuxième unité de stockage/d'alimentation (250) est composé d'une plaque latérale formant un espace de stockage des billets de banque dans la deuxième unité de stockage/d'alimentation (250). 5

4. Dispositif de traitement de billets de banque selon la revendication 1 ou 2, **caractérisé en ce que** l'élément de régulation (74) prévu dans la deuxième unité de stockage/d'alimentation (250) est composé d'un bouchon contre lequel les billets de banque envoyés de l'unité de transport (230) à la deuxième unité de stockage/d'alimentation (250) se heurtent, et les billets de banque se heurtant au bouchon sont stockés dans un espace de stockage des billets de banque dans la deuxième unité de stockage/d'alimentation (250). 10 15
5. Dispositif de traitement de billets de banque selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** la deuxième unité de stockage/d'alimentation (250) est composée d'une cassette de stockage de billets de banque (250) qui est capable d'être montée sur un corps principal du dispositif de traitement de billets de banque (22), et une force d'entraînement de l'élément d'entraînement (72, 76) est fournie à partir du corps principal du dispositif de traitement de billets de banque (22). 20 25 30
6. Procédé d'exécution d'un processus de rapprochement de stocks de billets de banque dans un dispositif de traitement de billets de banque selon l'une quelconque des revendications 1 à 5, le procédé comprenant : 35

le déplacement de l'élément de régulation (70, 74) pour réguler une position des billets de banque stockés dans la deuxième unité de stockage/d'alimentation (250) par l'élément d'entraînement (72, 76) vers la position stockée dans l'unité de mémoire (296) correspondant à la coupure des billets de banque sur lesquels le processus de rapprochement de stocks est exécuté ; 40 45

l'exécution du processus de rapprochement de stocks dans lequel les billets de banque sont alimentés à partir de la première unité de stockage/d'alimentation (250) et envoyés à la deuxième unité de stockage/d'alimentation (250) par l'unité de transport (230), les billets de banque sont ensuite alimentés à partir de la deuxième unité de stockage/d'alimentation (250) et renvoyés à la première unité de stockage/d'alimentation (250) par l'unité de transport (230). 50 55

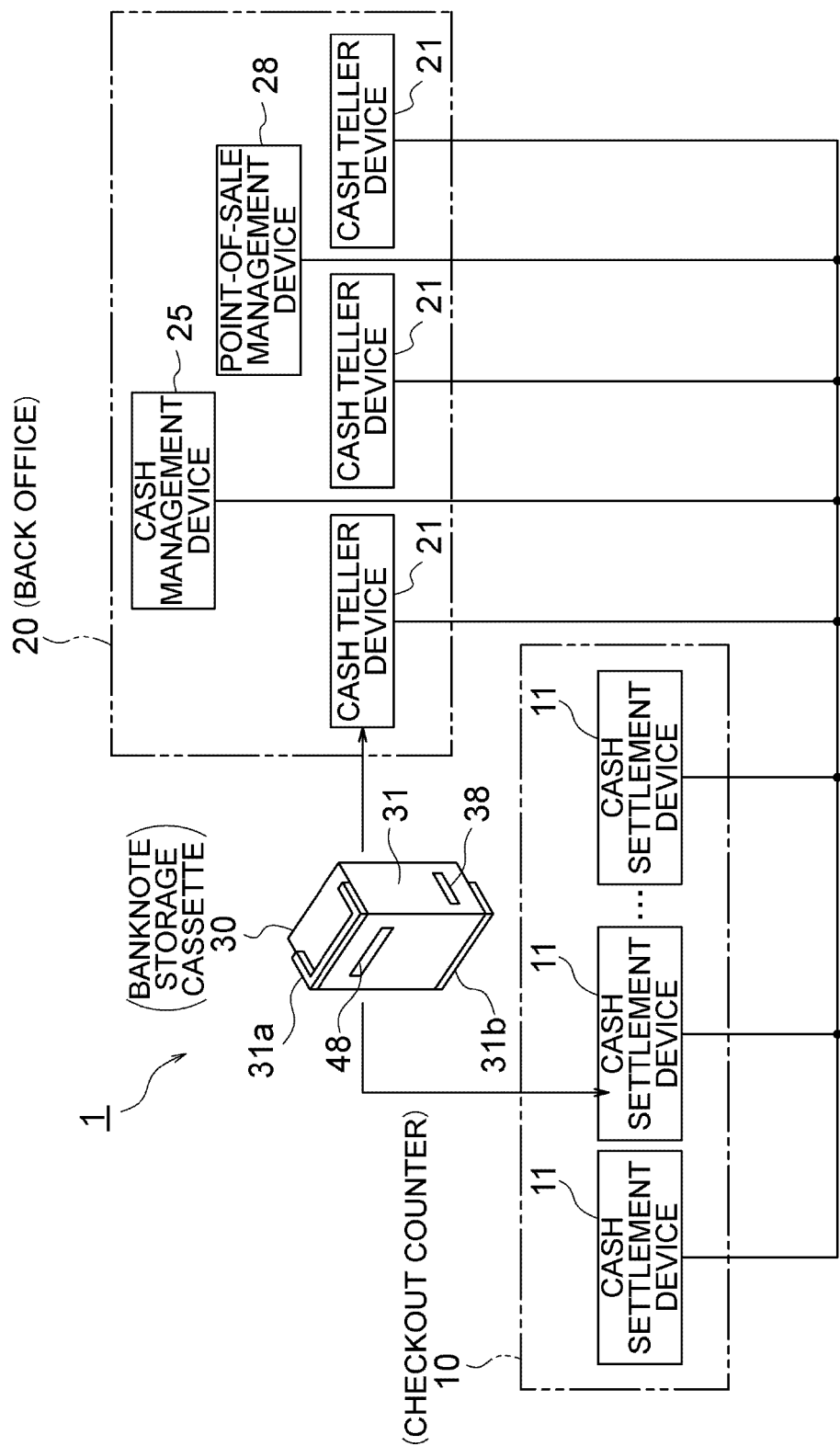


FIG. 1

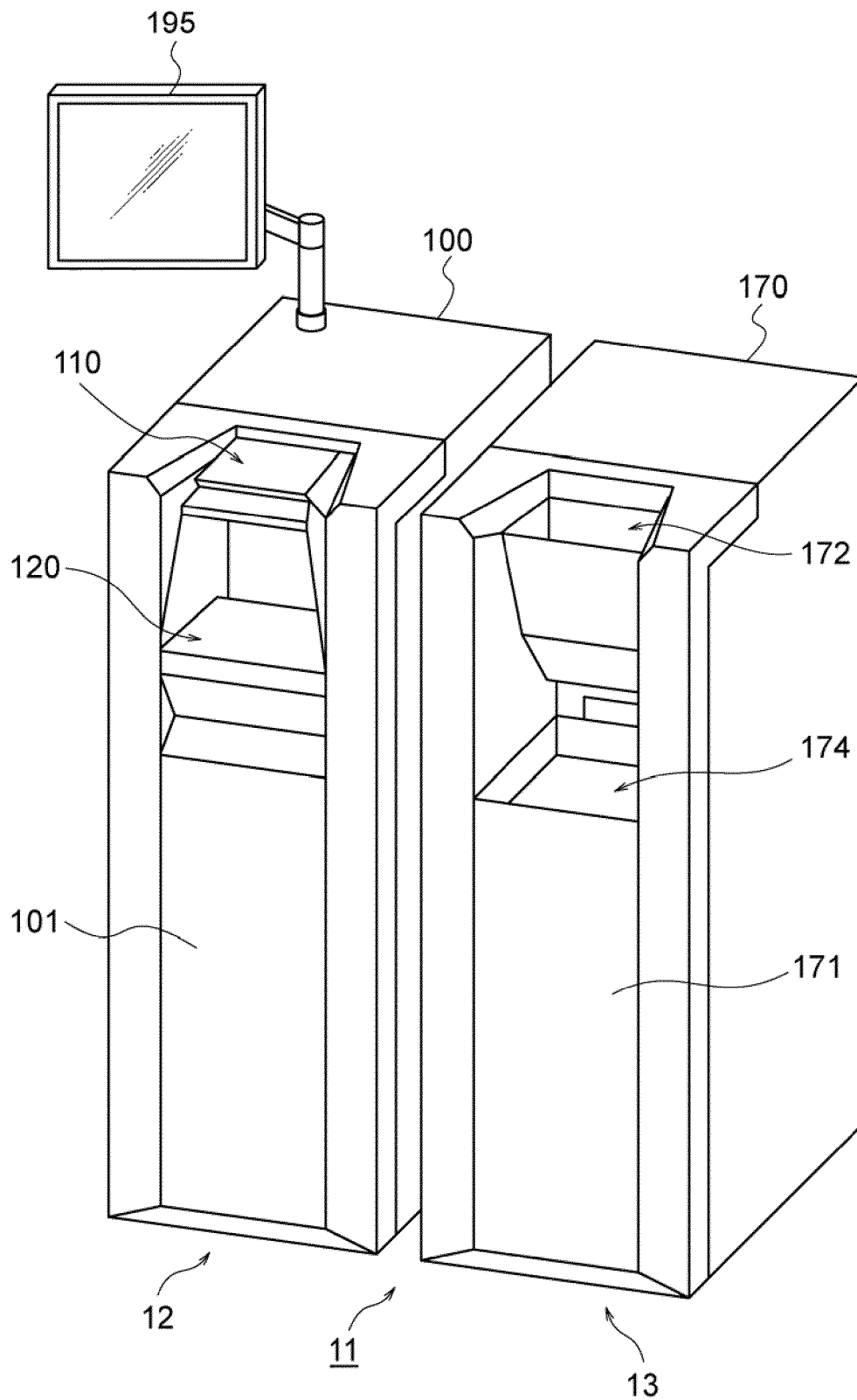


FIG. 2

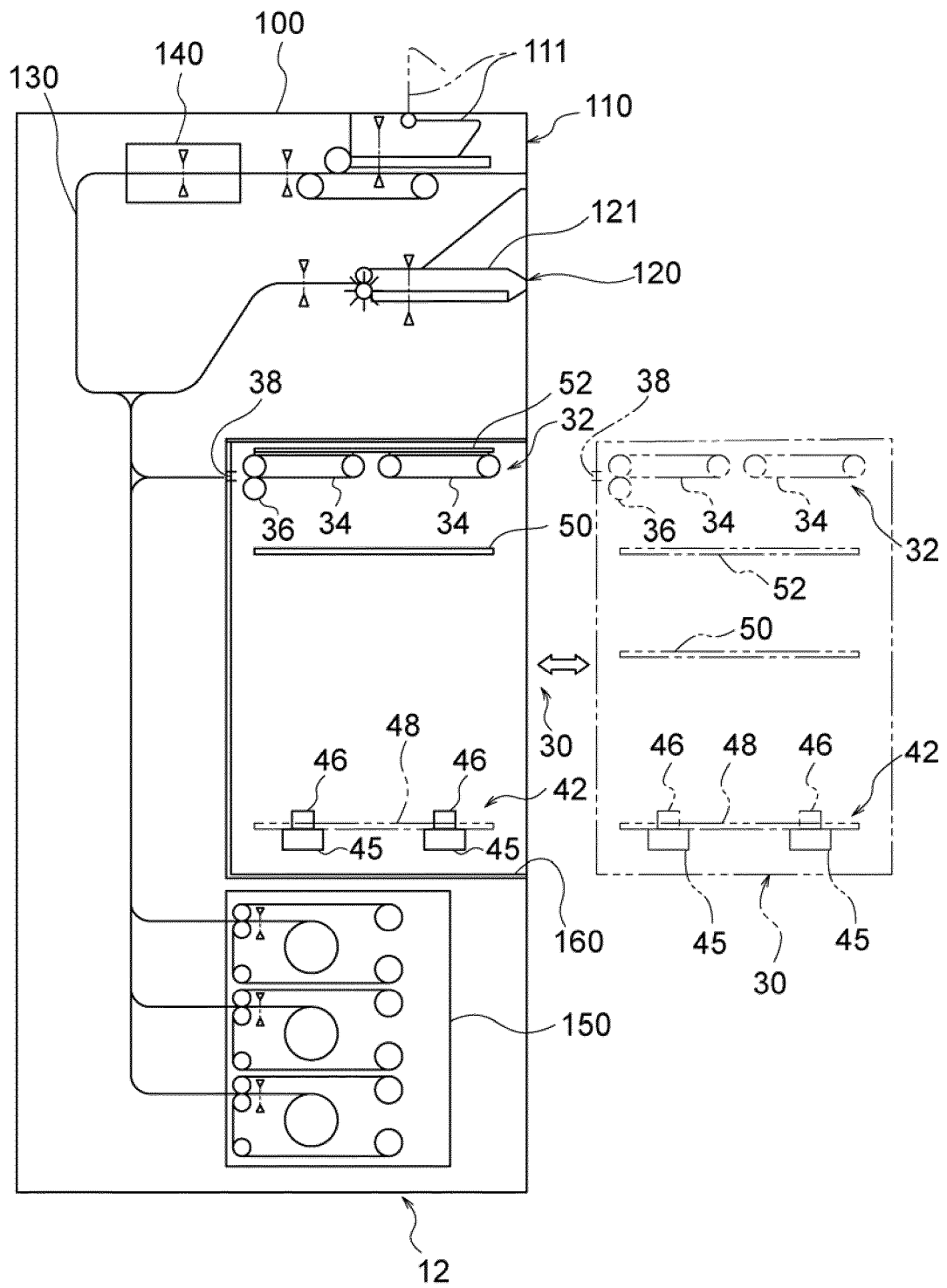


FIG. 3

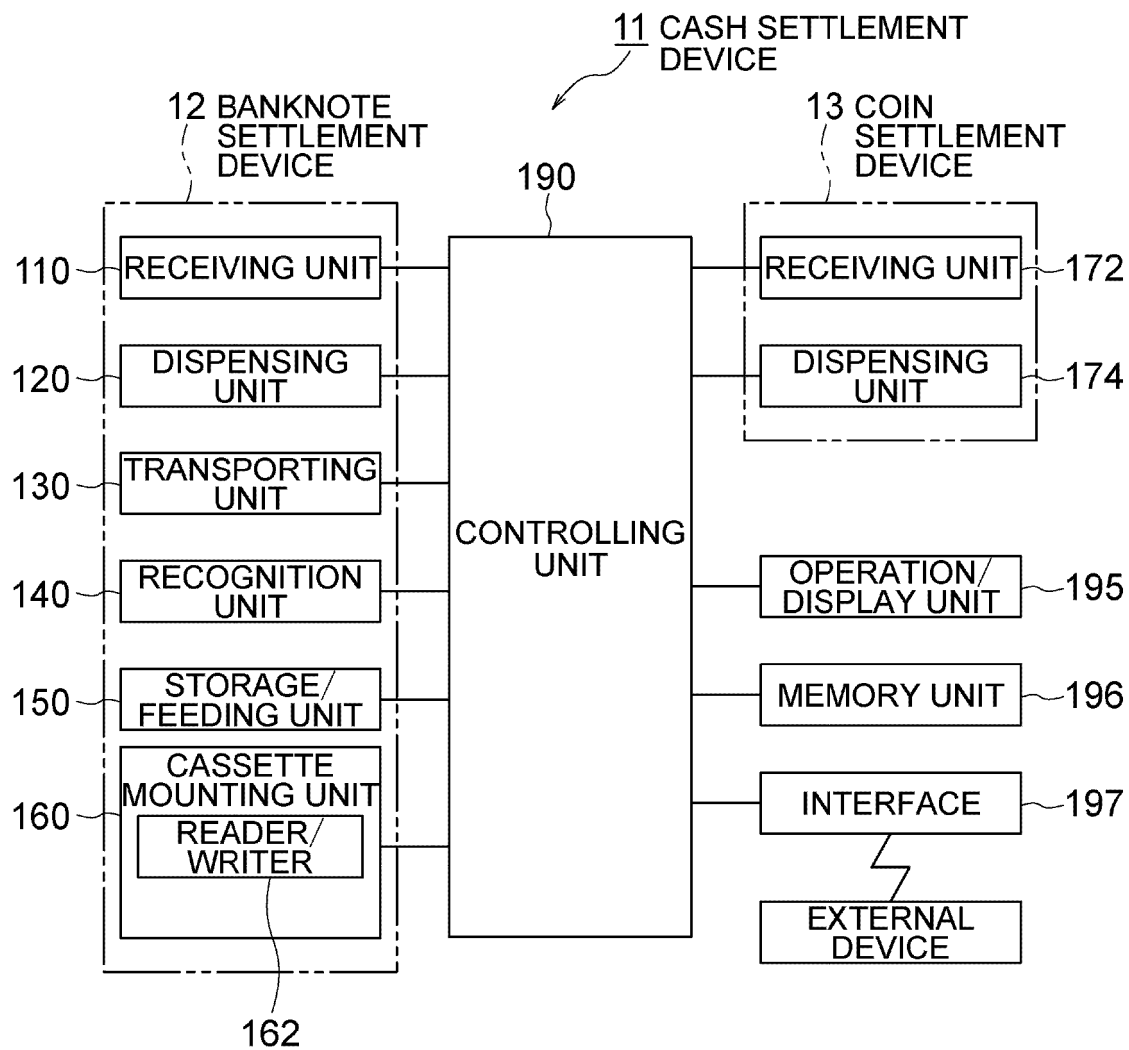


FIG. 4

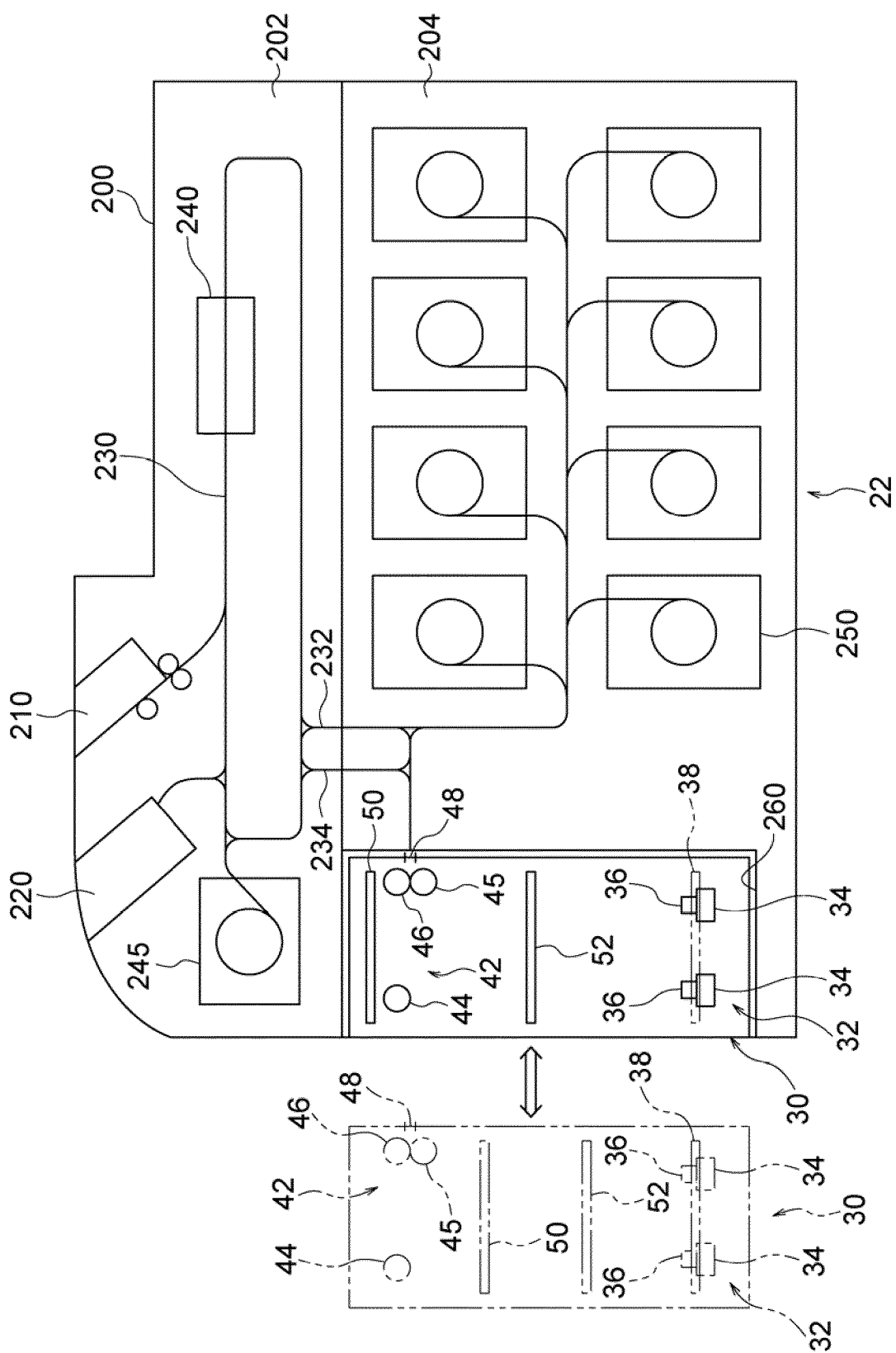


FIG. 5

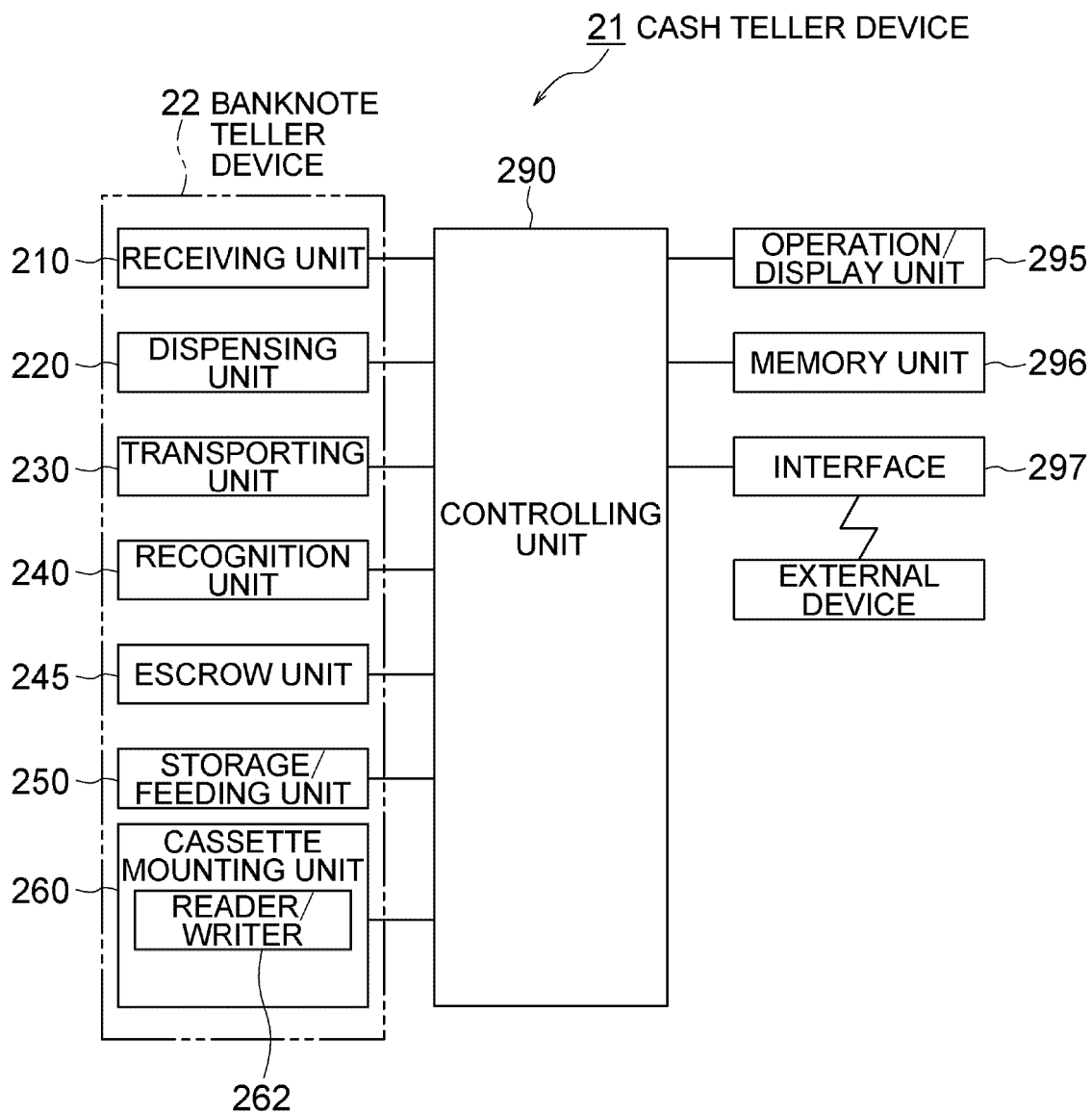


FIG. 6

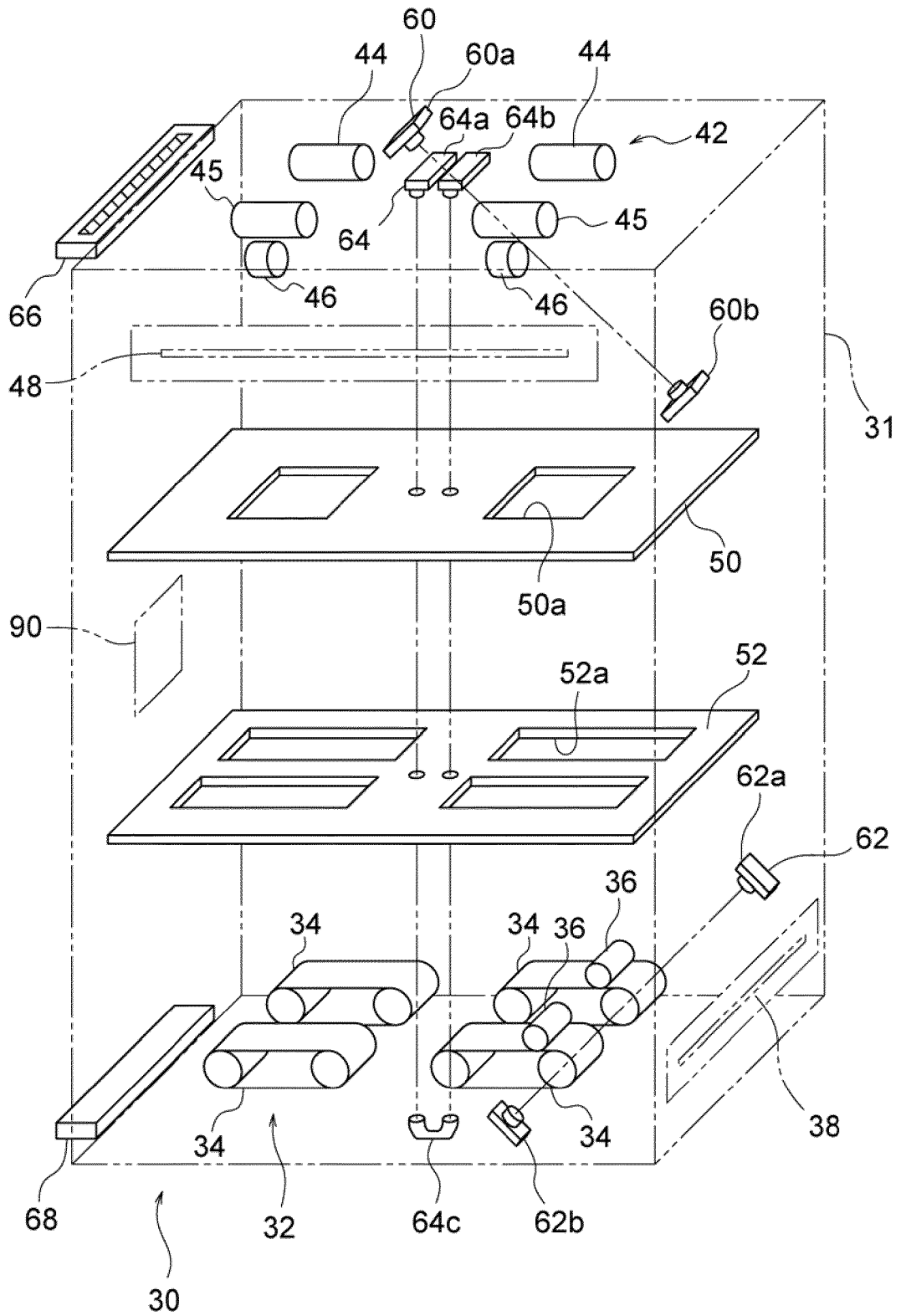


FIG. 7

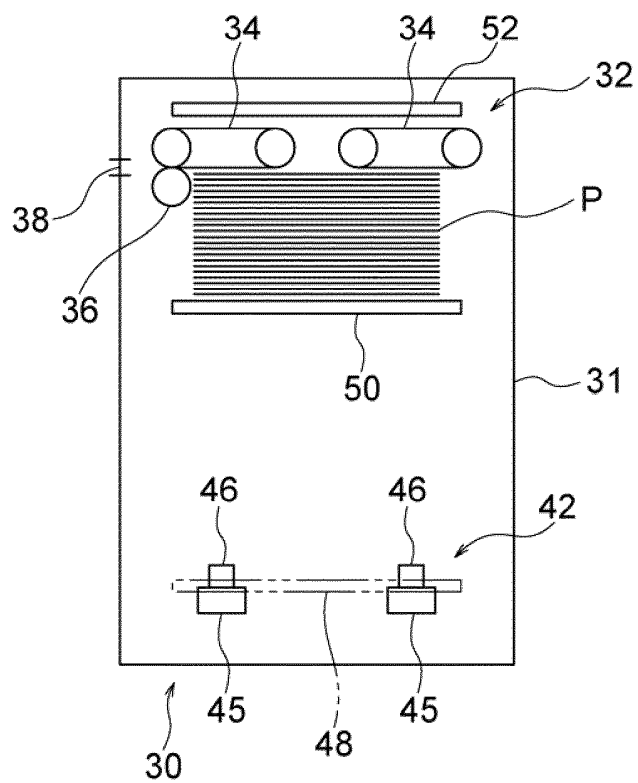


FIG. 8

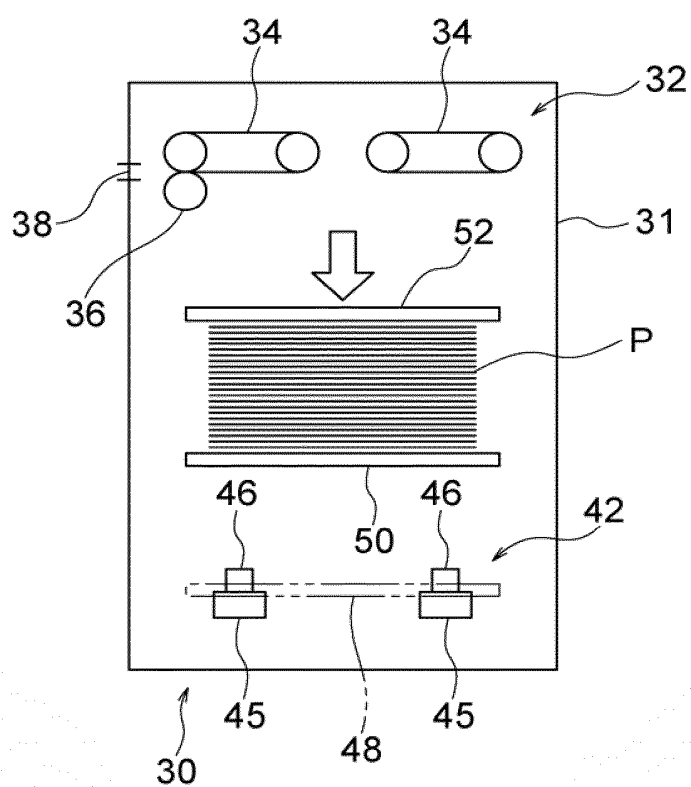


FIG. 9

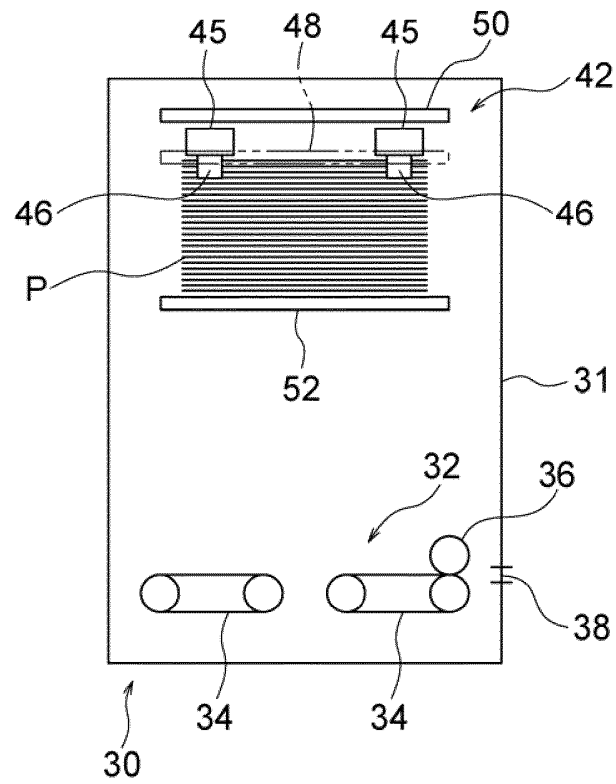


FIG. 10

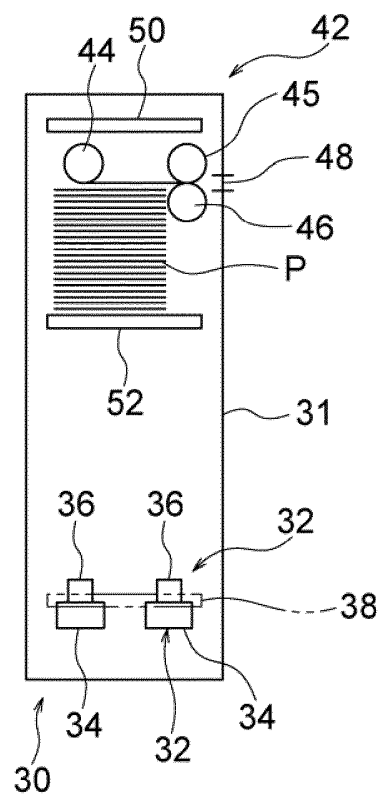


FIG. 11

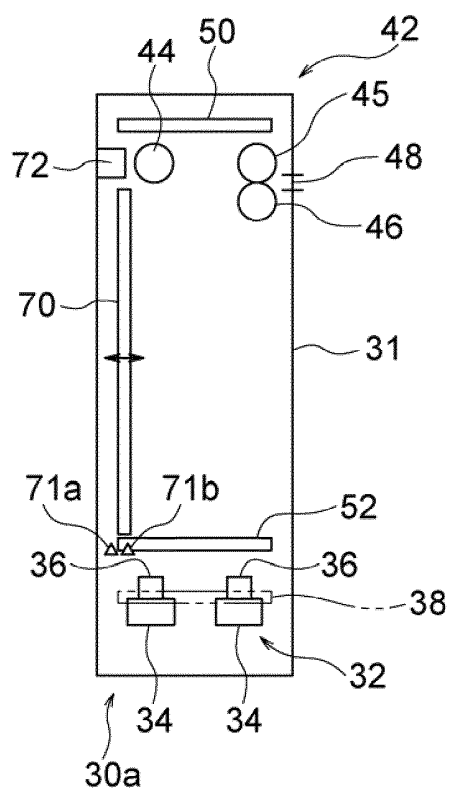


FIG. 12

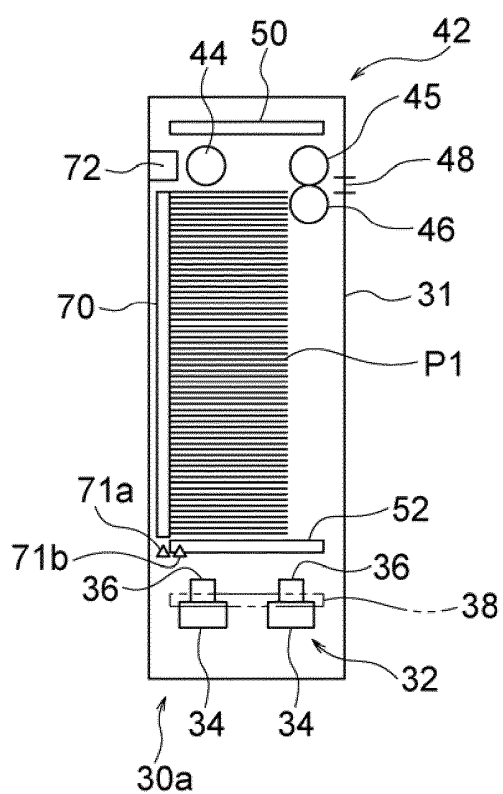


FIG. 13

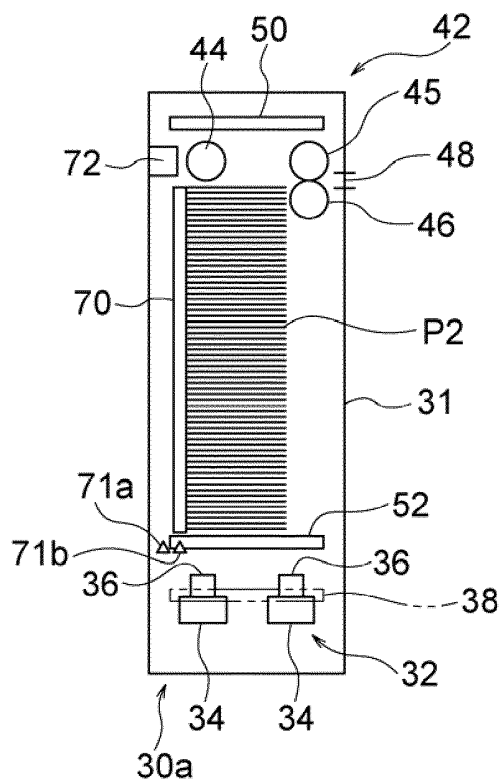


FIG. 14

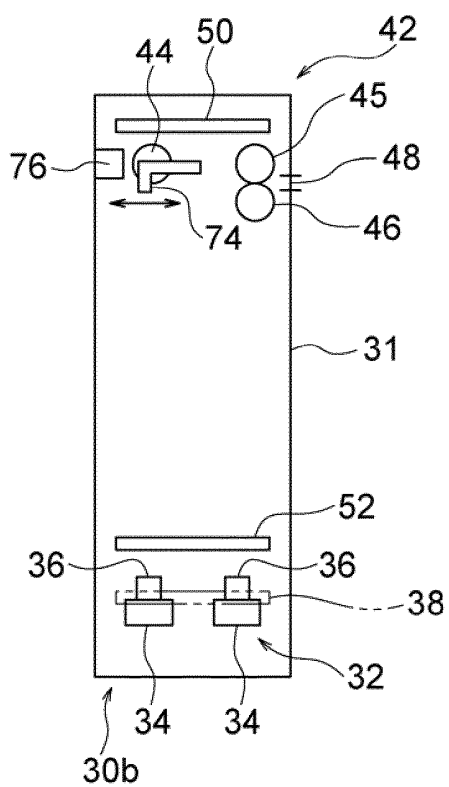


FIG. 15

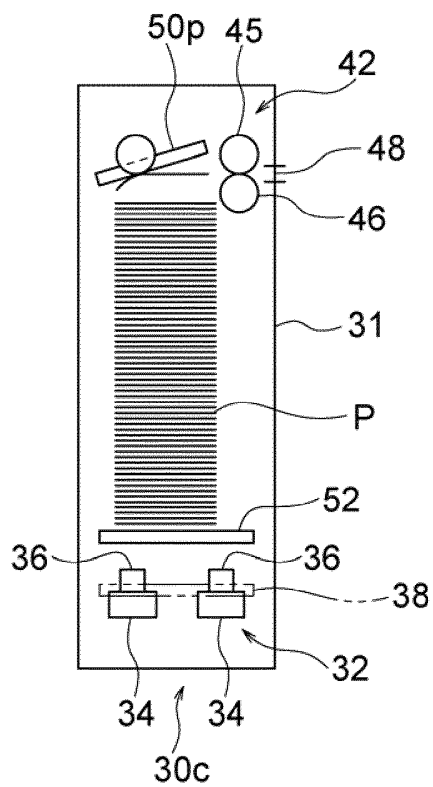


FIG. 16

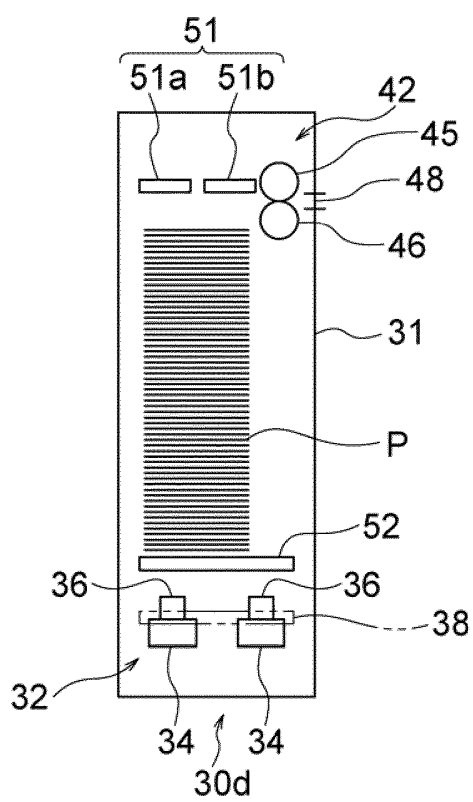


FIG. 17

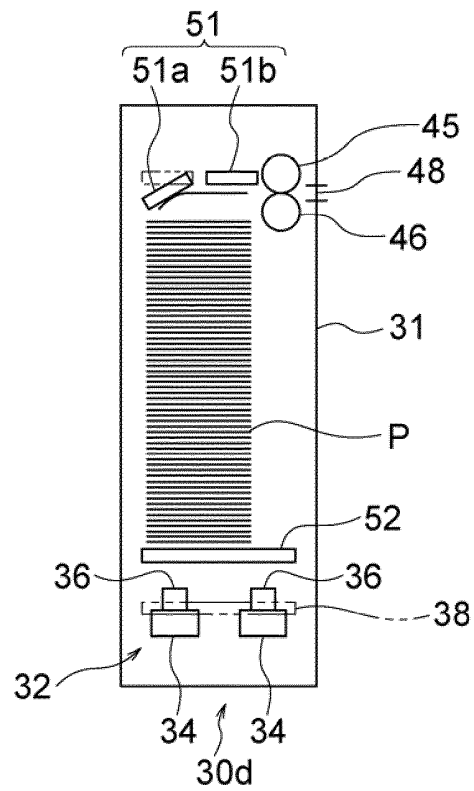


FIG. 18

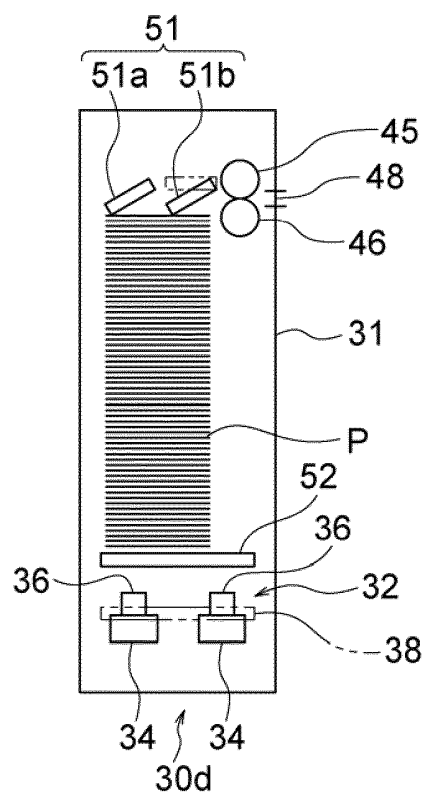


FIG. 19

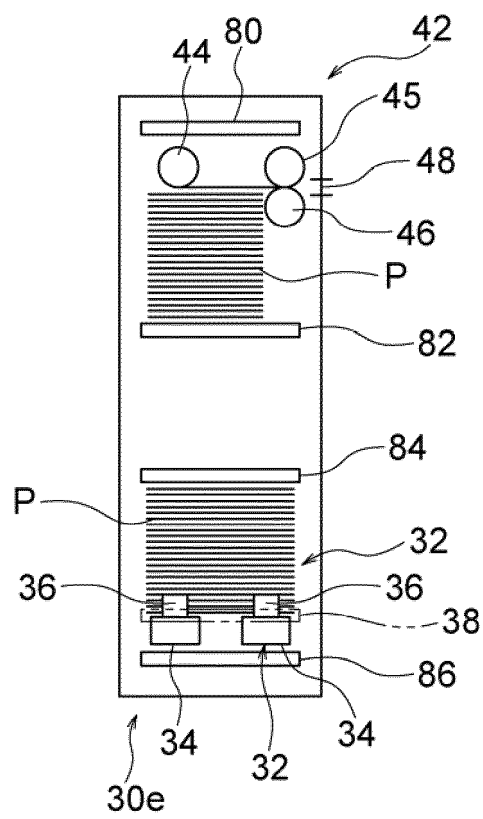


FIG. 20

REFERENCES CITED IN THE DESCRIPTION

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