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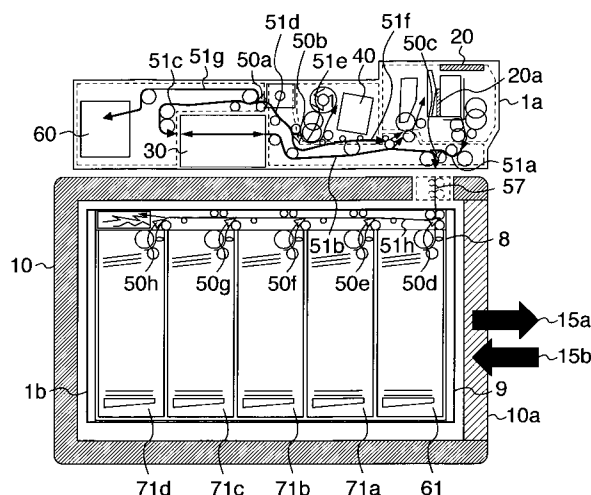
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(54) **Bill receiving and dispensing apparatus**

(57) To improve the operation efficiency of a clerk during maintenance and use, there is provided a bill receiving and dispensing apparatus including: a receiving/dispensing port (20) through which a bill put in is received or a bill is discharged; a bill determination section (30) which determines a bill; a temporary storage box (40) which temporarily stores the bill accepted through the receiving/dispensing port (20); a stacker (71a-71d) which accommodates the received bill and/or the bill to be dis-

charged; a stacker transport path portion (8) including a first bill transport path (51h) through which a bill is transported from and/or to the stacker (71a-71d); a second bill transport path (51a-51g) through which a bill is transported to the receiving/dispensing port (20), the bill determination section (30), the temporary storage box (40) and the first bill transport path (51h) of the stacker transport path portion (8); and a mounting/demounting means which mounts and demounts the stacker transport path portion (8).

FIG. 3



Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to an art in a bill receiving and dispensing apparatus for receiving and paying a bill, that is effective in improving the operability at the time of mounting/demounting a stacker and the maintainability when an abnormality such as a jam in a stacker contained in a safe or in a stacker transport path portion occurs.

[0002] In recent years, a bill receiving and dispensing apparatus mounted in an automatic cash transaction apparatus such as an automatic teller machine (ATM) and a cash dispenser (CD) placed in a store such as a banking institution and a convenience store adopts a structure in which stackers containing bills are accommodated side by side in a stacker container portion (tray) disposed in a lower section of the bill receiving and dispensing apparatus, and in which the tray accommodating the plurality of stackers and a stacker transport path portion through which a bill is transported from the plurality of stackers are accommodated or housed as a lower unit in a safe. On the other hand, mechanical portions of a bill receiving/dispensing port, a bill identification portion and the like are put together in an upper section of the bill receiving and dispensing apparatus and disposed as an upper unit, in general.

[0003] In maintenance and use of the bill receiving and dispensing apparatus taking such a form, it has been common that a clerk mounts/demounts the stackers, removes a jamming bill or the like by sliding and drawing out or pushing out the lower unit and by opening and closing the stacker transport path portion disposed above the tray in the lower unit.

[0004] As this kind of conventional apparatus, a bill receiving and dispensing apparatus shown in JP-A-2006-111446 has been proposed, for example.

BRIEF SUMMARY OF THE INVENTION

[0005] In the bill receiving and dispensing apparatus described in JP-A-2006-111446, in order to mount/demount the stacker, it is necessary that a clerk opens the stacker transport path portion disposed above the tray after drawing the lower unit out of the safe. The stacker transport path portion is constructed as a transport path common to all stackers, and thus tends to increase in weight. Because of this reason, the operability in mounting/demounting the stacker is considerably low, so that the operating efficiency of the clerk is reduced.

[0006] In some cases, the stacker transport path portion may be constructed integrally with the upper unit to ensure the operability at the time of mounting/demounting the stacker while only the tray may be slidable in the safe. In this case, in view of security insurance, there is a limitation that an opening area of the safe cannot be increased and, therefore, a need arises to dispose a con-

nection transport path for connecting the stacker in the safe and the upper stacker transport path disposed outside the safe, for each stacker. In addition, in the case that an abnormality such as a jam occurs in the connection transport path, operations of drawing out the upper unit, removing a jamming bill from a lower side of the upper unit and the like are required. In addition, when the tray is drawn out of the bill receiving and dispensing apparatus, there is a possibility that a bill remaining due to jamming falls into the safe, for example. Because of these reasons, the maintainability is low, so that the operating efficiency of the clerk is reduced.

[0007] An object of the present invention is to provide a bill receiving and dispensing apparatus capable of improving the operating efficiency of a clerk during maintenance and use of the apparatus by making it possible to mount and demount a stacker transport path portion of the apparatus.

[0008] To achieve the above-described object of the present invention, there is provided a bill receiving and dispensing apparatus including: a receiving/dispensing port through which a bill put in is accepted or a bill is discharged; a bill determination section which determines a bill; a temporary storage box which temporarily contains the bill accepted through the receiving/dispensing port; a stacker which contains the accepted bill and/or the bill to be discharged; a stacker transport path portion having a first bill transport path through which a bill is transported from the stacker and/or a bill is transported to the stacker; a second bill transport path through which a bill is transported to the receiving/dispensing port, the bill determination section, the temporary storage box and the first bill transport path in the stacker transport path portion; and a mounting/demounting means for mounting and demounting the stacker transport path portion.

[0009] According to the present invention, the operability in mounting/demounting a stacker and the maintainability such as removal of a jam or the like are improved, thereby improving the operating efficiency of the clerk.

[0010] Other objects, features and advantages of the invention will become apparent from the following description of the embodiments of the invention taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0011]

Fig. 1 is a perspective view showing an external appearance of an automatic cash transaction apparatus 101;

Fig. 2 is a block diagram showing the control relations in the automatic cash transaction apparatus 101;

Fig. 3 is a side view of a bill receiving and dispensing apparatus 1;

Fig. 4 is a block diagram showing the control relations

in the bill receiving and dispensing apparatus 1;
 Fig. 5 is a view showing an embodiment of the present invention;
 Fig. 6 is a view showing mounting/demounting operations of the embodiment;
 Figs. 7A and 7B are views showing mounting/demounting operations of the embodiment; and
 Fig. 8 is a control flow diagram of draw-out inhibition mechanisms 13a, 13b of the embodiment.

DETAILED DESCRIPTION OF THE INVENTION

[0012] An embodiment of the present invention will be described below with reference to the accompanying drawings.

[0013] Fig. 1 shows an external appearance of an automatic cash transaction apparatus 101. Fig. 2 is a control block diagram showing the control relations in the automatic cash transaction apparatus 101. The automatic cash transaction apparatus 101 which performs processing such as a deposit, a payment, a transfer and the like by using a card, a bill and a statement sheet as mediums will be described with reference to Figs. 1 and 2.

[0014] The automatic cash transaction apparatus 101 is constituted by a card/statement sheet processing section 102 which processes a user's transaction card and a transaction statement sheet, a bankbook processing section 103 which processes a bankbook, a casing 101c which covers the apparatus, a customer operation section 105 on which information necessary for a customer is displayed or to which a customer inputs necessary information, a bill receiving apparatus 1 which receives a bill, an external interface section 106 which transmits data to the outside or receives data from the outside, a clerk operation section 108 used by a clerk at the time of maintenance, a memory section 109 which stores basic information of each apparatus, a program, etc., a main unit control section 107 which controls these components of the apparatus, and a power supply section 110 which supplies electric power to the above-described components. In Fig. 1, the interface section 106, the clerk operation section 108, the memory section 109, the main unit control section 107 and the power supply section 110 are omitted.

[0015] Fig. 3 is a side view showing the configuration of the bill receiving and dispensing apparatus 1 mounted in the automatic cash transaction apparatus 101 shown in Fig. 1. The right-hand side of Fig. 3 corresponds to an apparatus front side at which a user stands at the time of a transaction.

[0016] The bill receiving and dispensing apparatus 1 is configured by being divided into an upper unit 1a and a lower unit 1b, in general terms. In the upper unit 1a, mechanisms necessary for receiving a bill from a user or paying a bill to a user are mainly collected. In the lower unit 1b, a plurality of stackers for holding bills received in a receiving transaction or bills to be paid in a payment transaction are provided in a safe 10. The upper unit 1a

and the lower unit 1b will be described below in detail.

[0017] The upper unit 1a is constituted by a receiving/dispensing port 20 through which a bill is received or discharged, a bill determination section 30 in which identification of a bill is performed, a temporary storage box 40 for temporarily storing a received bill until a transaction is established, a reject box 60 for accommodating a bill not to be paid, and a control section 19 which controls each section. In Fig. 3, the control section 19 is omitted.
 The receiving/dispensing port 20 has a partition plate 20a movable in accordance with processing. A bill draw-out portion is on the front side of the partition plate 20a, and a bill stacking portion is on the back side of the partition plate 20a.

Next, a bill transport path (also referred to as a second bill transport path) through which a bill is transported to each section of the upper unit 1a will be described. The bill transport path is constituted by a plurality of transport paths and sorting gates for sorting the course of transport of a bill in accordance with destinations. The bill transport path in the upper unit 1a is constituted by transport paths 51a and 51b connecting the bill draw-out portion of the receiving/dispensing port 20 and the bill determination section 30, a transport path 51c connecting a sorting gate 50a and the bill determination section 30, a transport path 51d connecting the sorting gate 50a and a sorting gate 50b, a transport path 51e connecting the sorting gate 50b and the temporary storage box 40, a transport path 51f connecting the sorting gate 50b and the bill stacking portion of the receiving/dispensing port, and a transport path 51g connecting the sorting gate 50a and the reject box 60. These bill transport paths in the upper unit 1a will be generally referred to as a bill transport path 51. A sorting gate 50c for sorting the course of transport of a bill so that the bill enters the lower unit 1b is provided at an intermediate position between the transport paths 51a and 51b connecting the receiving/dispensing port 20 and the bill determination section 30. A connecting transport path 57 for delivery of a bill between the upper unit 1a and the lower unit 1b is provided in the safe 10 below the sorting gate 50c.

Next, the lower unit 1b will be described. The lower unit 1b contained in the safe 10 is constituted by a stacker container portion 9 (also referred to as a tray) including stackers 71a to 71d for accommodating bills by kind and a storage specific box 61 for accommodating bills not to be recycled, and a stacker transport path portion 8 placed above the stackers 71a to 71d and the storage specific box 61. The stacker transport path portion 8 is constituted by a transport path 51h (also referred to as a first bill transport path) and sorting gates 50d to 50h provided on the upper side of bill outlets/inlets of the stackers 71a to 71d and the storage specific box 61 for sorting the course of transport of bills which are to be accommodated in the stackers 71a to 71d and the storage specific box 61, respectively. The stacker transport path portion 8 of the present embodiment is a bidirectional transport path through which bills are transported

from the stackers 71a to 71d to the connecting transport path 57, and through which bills are also transported from the connecting transport path 57 to the stackers 71a to 71d and the storage specific box 61. At least the transport paths 51b, 51c, 51d, and 51e and the connecting transport path 57 are constituted by bidirectional transport paths capable of transporting bills in either of forward and backward directions, also. However, since the transport directions of the transport paths vary depending on the configuration and use of the bill receiving and dispensing apparatus, the transport directions are not limited to those described in the present embodiment. In addition, sensors for monitoring transport of bills are provided on the transport paths to enable detection of the occurrence of a jam or the like.

[0020] The upper unit 1a and the lower unit 1b are respectively connected to the automatic cash transaction apparatus 101 by a lock mechanism not shown in the figures. By unlocking the lock mechanism, it becomes possible to draw the upper unit 1a or the lower unit 1b respectively out of the apparatus for removal of a jamming bill or for mounting/demounting of the stackers 71a to 71d and the storage specific box 61. In particular, the lower unit 1b or the tray 9 is kept in the safe and, therefore, a clerk opens a safe door 10a and draws out the lower unit 1b or the tray 9 in the direction of arrow 15a and performs removal of a jamming bill in the stacker transport path portion 8 or supply/collection of bills in the stackers 71a to 71d and the storage specific box 61. After performing jam removal or supply/collection of bills, the clerk returns the lower unit 1b or the tray 9 in the direction of arrow 15b and closes the safe door 10a to end the jam removal or bill supply/collection process.

[0021] Fig. 4 is a control block diagram showing the control relations in the bill receiving and dispensing apparatus 1 described above with reference to Fig. 3.

[0022] The control section 19 of the bill receiving and dispensing apparatus 1 is connected through a circuit to the main unit control section 107 of the automatic cash transaction apparatus 101 and performs control in accordance with a command from the main unit control section 107. The control section 19 also transmits information of the state of the bill receiving and dispensing apparatus 1 to the main unit control section 107 and performs control of each section in accordance with transaction processing in the bill receiving and dispensing apparatus 1. The units of the bill receiving and dispensing apparatus 1 including the receiving/dispensing port 20, the bill determination section 30, the temporary storage box 40 (also referred to as a temporary storing section), the bill transport path 51, the reject box 60, the storage specific box 61, the stackers 71a to 71d are operated by controlling drive motors, electromagnetic solenoids and the like (not shown) by the control section 19.

[0023] Next, receipt transaction processing and payment transaction processing, which are main processings of the bill receiving and dispensing apparatus 1, will be described.

[0024] First, the receipt transaction processing will be described. Bills drawn out from the receiving/dispensing port 20 are transported to the bill determination section 30 through the transport paths 51a and 51b. The determination as to whether each transported bill is authentic or not, and the determination as to whether the bill is normal or damaged are performed by sensors or the like mounted in the bill determination section 30. On the basis of the bill determination results, the control section 19 counts the number of bills of each kind, determines whether each bill is acceptable or not, determines destinations to which the bills are to be transported, and stores the information of the authenticity/non-authenticity and the normal/damaged state of each bill, the information as to whether each bill is acceptable or not and the information of the transport destinations, as bill information, in the memory section (not shown). The determined bill is transported by means of the transport path 51c to the sorting gate 50b via the sorting gate 50a.

[0025] The course of transport of the bill transported to the sorting gate 50b is sorted on the basis of the bill information stored in the memory section. That is, each bill which is acceptable according to the bill information is transported to the temporary storage box 40 via the transport path 51e to be temporarily contained in the temporary storage box 40. On the other hand, each unacceptable bill is transported to the bill stacking portion formed in a rear section of the receiving/dispensing port 20 to be put in a stack of unacceptable bills as reject bills during the receipt processing.

[0026] When the amount of money of the counted bills is determined by a user (namely, it is determined that the receipt transaction is OK), the bill receiving and dispensing apparatus 1 draws out the bills temporarily contained in the temporary storage box 40 into the bidirectional transport path 51e in the order reverse to the order when the bills have been contained. Each bill drawn out into the transport path 51e is transported in the direction opposite to the direction when being transported so as to be contained in the temporary storage box 40, passes through the sorting gate 50a, the bill determination section 30 and the transport path 51b, and is then transported into the lower unit in accordance with the sorting gate 50c of which the direction has been changed to the connecting transport path 57. The bill receiving and dispensing apparatus 1 changes the sorting gates 50d to 50h so that the bill transported into the lower unit is transported to the transport destination stored in the memory section (not shown), and is thereby transported and contained into one of the reject box 60 and the stackers 71a to 71d, and completes the receipt transaction processing.

[0027] Next, the payment transaction processing will be described. In the payment transaction processing, the bill receiving and dispensing apparatus 1 draws out, on the basis of payment information input by a user through the customer operation section 105, a designated number of bills from the stackers 71a to 71d in which bills are contained separately by kind. The bills drawn out are

transported in the order of transport path 51h, the transport path 57, the transport path 51b and the bill determination section 30 and are determined one by one in the bill determination section 30. On the basis of the bill determination results, the control section 19 counts the number of bills of each kind, determines whether each bill is payable or not, and determines a destination to which the bill is to be transported. Each bill determined to be non-payable is transported to the reject box 60 and put in a stack therein in accordance with the sorting gate 50a of which the direction has been changed toward the reject box 60. On the other hand, each bill determined to be payable is transported to the bill stacking portion of the receiving/dispensing port 20 via the sorting gates 50a and 50b, and is put in a stack in the bill stacking portion. The bill receiving and dispensing apparatus 1 discharges the bills stacked in the bill stacking portion of the receiving/dispensing port 20 to the user by opening a shutter on the upper surface of the receiving/dispensing port 20, and then completes the payment transaction processing.

[0028] Next, a means for mounting/demounting the stacker transport path portion 8 of the bill receiving and dispensing apparatus 1 will be described. In the following, a configuration consisting of a holding mechanism and a receiving portion thereof is described as an example of the mounting/demounting means.

[0029] Fig. 5 is a side view showing details of the lower unit 1b of the bill receiving and dispensing apparatus 1. The tray 9 in the lower unit 1b has portions 11a to 11g (hereinafter generally referred to as a holding mechanism 11) for mounting/demounting the stacker transport path portion 8, and the safe 10 has portions 12a to 12g (hereinafter generally referred to as a holding mechanism 12) for mounting/demounting the stacker transport path portion 8. The stacker transport path portion 8 has receiving portions 8a to 8d to be held by the holding mechanism 11 and the holding mechanism 12. The holding mechanism 11 and the receiving portions 8a and 8b associated with the holding mechanism 11 are also referred to as a first mounting/demounting means, and the holding mechanism 12 and the receiving portions 8d and 8c associated with the holding mechanism 12 are also referred to as a second mounting/demounting means.

[0030] The holding mechanism 11 is constituted by holding members 11b and 11c, pivots 11d and 11e, pins 11f and 11g and an operating portion 11a connected to the holding members 11b and 11c by the pins 11f and 11g. The holding members 11b and 11c rotate around the pivots 11d and 11e mounted to the tray 9 and hold the receiving portions 8a and 8b provided on the stacker transport path portion 8.

[0031] The holding mechanism 12 is constituted by holding members 12b and 12c, pivots 11d and 11e, pins 12f and 12g and an operating portion 12a connected to the holding members 12b and 12c by the pins 12f and 12g. The holding members 12b and 12c rotate around the pivots 12d and 12e mounted to the safe 10 and hold the receiving portions 8c and 8d provided on the stacker

transport path portion 8.

[0032] In addition, the holding mechanism 11 and the holding mechanism 12 have draw-out inhibition mechanisms 13a and 13b, respectively, which inhibit or permit disengagement of the holding mechanism 11 and the holding mechanism 12 from the holding state by operating actuators (not shown).

[0033] The bill receiving and dispensing apparatus 1 further has slide rails 24 for enabling a clerk to easily draw out the tray 9, and a cable guide 23 which prevents a cable from obstructing sliding when the tray 9 is drawn out.

[0034] Fig. 6 is a view showing the operation to mount/demount the stackers 71a to 71d and the storage specific box 61.

[0035] The actions of the mechanisms in the present embodiment will be described below with reference to Fig. 6. In the following, a case where a clerk demounts and mounts the stackers 71a to 71d or the storage specific box 61 for the purpose of taking out bills contained in the stackers 71a to 71d and the storage specific box 61 or supplying the stackers 71a to 71d with bills is described as an example.

[0036] In the case of demounting and mounting the stackers 71a to 71d and the storage specific box 61, a clerk opens the safe door 10a and operates the operating portion 11a in the direction of arrow 14a to rotate the holding members 11b and 11c around the pivots 11d and 11e in the directions of arrows 15a and 15b, thereby disengaging the holding members 11b and 11c from the state of holding the receiving portions 8a and 8b formed on the stacker transport path portion 8. Then, the clerk can draw out the tray 9 separately from the stacker transport path portion 8 in the lower unit 1b. The clerk subsequently unlocks the lock mechanism (not shown) that fastens the lower unit 1b to the automatic cash transaction apparatus 101, and draws out the tray 9 in the direction of arrow 16a (out of the safe 10).

[0037] The clerk pulls out the stackers 71a to 71d and the storage specific box 61 in the direction of arrow 17a from the tray 9 having been drawn out of the safe 10, takes out the contained bills or supplies the stackers 71a to 71d with bills, and puts the stackers 71a to 71d or the storage specific box 61 into the tray 9 in the direction of arrow 17b.

[0038] The clerk puts the tray 9 containing the stackers 71a to 71d or the storage specific box 61 into the safe 10 in the direction of arrow 16b, locks the tray 9 on the automatic cash transaction apparatus 101 with the lock mechanism (not shown), and thereafter operates the operating portion 11a in the direction opposite to the direction of arrow 14a. The holding members 11b and 11c are thereby rotated around the pivots 11d and 11e in the directions opposite to the directions of arrows 15a and 15b to hold the receiving portions 8a and 8b of the stacker transport path portion 8. The clerk closes the safe door 10a to end the process of taking out the bills contained in the stackers 71a to 71d and the storage specific box

61 or supplying bills to the stackers 71a to 71d.

[0039] Figs. 7A and 7B are views showing the mounting/demounting operation in a case where the stacker transport path portion 8 and the tray 9 are integral with each other, i.e., in a state of the lower unit 1b. Fig. 7A is a side view of the bill receiving and dispensing apparatus 1 corresponding to Fig. 6. Fig. 7B is a view of the lower unit of the bill receiving and dispensing apparatus 1 seen from the right-hand side of Fig. 7A (from the front side of the bill receiving and dispensing apparatus 1).

[0040] The actions of the mechanisms in the present embodiment will be described below with reference to Figs. 7A and 7B. In the following, recovery processing in a case where an abnormality such as a jam occurs in the stacker transport path portion 8 is described as an example.

[0041] In the case of recovery of an abnormality such as a jam which has occurred in the stacker transport path portion 8, the clerk opens the safe door 10a and operates the operating portion 12a in the direction of arrow 14b to rotate the holding members 12b and 12c around the pivots 12d and 12e in the directions of arrows 15c and 15d, thereby disengaging the holding members 12b and 12c from the state of holding the receiving portions 8c and 8d formed on the stacker transport path portion 8. Then, the stacker transport path portion 8 and the tray 9 can be drawn out in an integral state, i.e., in the state of the lower unit 1b.

[0042] Further, the clerk unlocks the lock mechanism (not shown) that fastens the lower unit 1b to the automatic cash transaction apparatus 101, and draws out the lower unit 1b in the direction of arrow 16a (out of the safe 10). The clerk opens the stacker transport path portion 8 constituting the lower unit 1b in the direction of arrow 18 and performs removal of a jamming bill or the like in the transport path 51h and the sorting gates 50d to 50h formed in the stacker transport path portion 8. In this way, the processing for recovery from an abnormality such as the occurrence of a jam can be easily performed.

[0043] After removal of a jamming bill or the like, the clerk closes the stacker transport path portion 8 in the direction opposite to the direction of arrow 18, puts the lower unit 1b into the safe 10 in the direction of arrow 16b, locks the lower unit 1b on the automatic cash transaction apparatus 101 with the lock mechanism (not shown), and thereafter moves the operating portion 12a in the direction opposite to the direction of arrow 14b. The holding members 12b and 12c are thereby rotated around the pivots 12d and 12e in the directions opposite to the directions of arrows 15c and 15d to hold the receiving portions 8c and 8d formed on the stacker transport path portion 8. The clerk closes the safe door 10a to end the processing for recovery from an abnormality such as a jam.

[0044] Fig. 8 is a control flow in a case where the bill receiving and dispensing apparatus 1 has draw-out inhibition mechanisms 13a and 13b (Fig. 5) which inhibit and permit disengagement of the holding mechanism 11 and

the holding mechanism 12 from the holding state.

[0045] When the holding mechanism 11 is disengaged from the holding state by a clerk, the control section 19 detects the disengagement of the holding mechanism 11 from the holding state through a detection section (not shown) (S201: YES), and inhibits disengagement of the holding mechanism 12 from the holding state by the draw-out inhibition mechanism 13a (S202). The stacker transport path portion 8 is thereby held in the safe 10, and the clerk can draw out only the tray 9. The need for the operation to open and close the stacker transport path portion 8 is eliminated at the time of mounting/demounting the stackers 71a to 71d and the storage specific box 61, thus improving the operability. After taking out bills or supplying bills, the clerk puts the tray 9 into the safe 10 in the direction of arrow 16b shown in Fig. 6, locks the tray 9 on the automatic cash transaction apparatus 101 with the lock mechanism (not shown), and thereafter makes the holding mechanism 11 hold the stacker transport path portion 8.

[0046] The control section 19 detects the holding state of the stacker transport path portion 8 by the holding mechanism 11 through a detection section (not shown) (S203: YES), and permits disengagement of the holding mechanism 12 from the holding state (S204). The clerk closes the safe door 10a to end the operation.

[0047] When the holding mechanism 12 is released from the holding state by the clerk, the control section 19 detects the disengagement of the holding mechanism 12 from the holding state through a detection section (not shown) (S205: YES), and inhibits disengagement of the holding mechanism 11 from the holding state by the draw-out inhibition mechanism 13a (S206). Inhibition of the disengagement of the holding mechanism 11 by the draw-out inhibition mechanism 13b enables the stacker transport path portion 8 and the tray 9 to be drawn as the lower unit 1b while being maintained integrally with reliability. The clerk is thereby enabled to easily remove a jamming bill or the like in the stacker transport path portion 8, thus improving the maintainability. After performing removal of a jamming bill or the like, the clerk puts the lower unit 1b into the safe 10 in the direction of arrow 16b shown in Fig. 7, locks the lower unit 1b on the automatic cash transaction apparatus 101 with the lock mechanism (not shown), and thereafter makes the holding mechanism 12 hold the stacker transport path portion 8.

[0048] The control section 19 detects the holding state of the stacker transport path portion 8 by the holding mechanism 12 through the detection section (not shown) (S207: YES), and permits disengagement of the holding mechanism 12 from the holding state (S208). The clerk closes the safe door 10a to end the operation.

[0049] The above-described inhibition of disengagement from the holding states with the draw-out inhibition mechanisms 13a and 13b is performed under exclusive control such that when disengagement of one of the holding mechanisms 11 and 12 from the holding state by a clerk is detected, disengagement of the other from the

holding state is inhibited. That is, a control means for performing exclusive control of inhibition or permission of mounting/demounting by the first mounting/demounting means and mounting/demounting by the second mounting/demounting means is provided. However, the condition for inhibition or permission may not be limited thereto.

[0050] For example, disengagement of the holding mechanism 12 from the holding state may be inhibited when a jam is detected in the bill transport paths 51. Alternatively, disengagement of the holding mechanism 11 from the holding state may be inhibited when a clerk designates taking out of bills from the storage specific box 61 and the stackers 71a to 71d or supply of bills to the stackers 71a to 71d through the clerk operation screen.

[0051] In the above-described embodiment, the occurrence of a clerk's operation error in the case of releasing a holding state can be reduced by setting the direction (14a) of operation of the operating portion 11a of the holding mechanism 11 and the direction (14a) of operation of the operating portion 12a of the holding mechanism 12 to be opposite to each other. In the case to holding the receiving portions 8a to 8d by the holding mechanisms 11 and 12, the direction of operation of the operating portion 11a of the holding mechanism 11 and the direction of operation of the operating portion 12a of the holding mechanism 12 may not be limited to the above-described embodiment, but may be selected from any directions.

[0052] In the above-described embodiment, it is possible to achieve the mounting/demounting means at a low cost by the structure in which the holding members 11b and 11c are mechanically connected to each other by the operating portion 11a and the structure in which the holding members 12b and 12c are mechanically connected to each other by the operating portion 12a. However, mounting/demounting of the stacker transport path portion is not limited to the case where the plurality of holding members and the plurality of operating portions are mechanically connected, but also by controlling the mounting/demounting means by the control section 19 upon receiving a command from the clerk operation section 108 or the like.

[0053] In the above-described embodiment, because the structure of the holding mechanisms 11 and 12 is a structure where the members are mechanically connected to each other, the holding mechanisms 11 and 12 are provided on the tray 9 and the safe 10 having a large installation space, while the receiving portions 8a to 8d are provided on the stacker transport path portion 8 having a small installation space. However, alternatively, the holding mechanisms 11 and 12 may be provided on the stacker transport path portion 8 while the receiving portions may be provided on the tray 9 and the safe 10. Also, the receiving portions 8a to 8d may be provided as a holding mechanism usable commonly by the holding mechanisms 11 and 12. Further, a holding mechanism

for directly holding the upper transport path 8 may be provided without providing the receiving portions 8a to 8d.

[0054] The present embodiment adopts the structure in which only the stacker transport path portion 8 can be mounted in and demounted from the bill receiving and dispensing apparatus 1. Therefore, it is possible to replace and maintain only the stacker transport path portion 8 when a malfunction of the stacker transport path portion 8 occurs.

[0055] While the mounting/demounting means for mounting the stacker transport path portion 8 in the tray 9 and demounting the stacker transport path portion 8 from the tray 9 has been described in the present embodiment, the mounting/demounting means may be configured so as to mount and demount the stacker transport path portion 8 and the stackers 71a to 71d when the stackers 71a to 71d are not contained in the tray 9. In addition, while the mounting/demounting means for mounting the stacker transport path portion 8 in the safe 10 and demounting the stacker transport path portion 8 from the safe 10 has been described, the stacker transport path portion 8 may be mounted in and demounted from the upper unit 1a if the lower unit 1b is not contained in the safe 10.

[0056] As described above, the present embodiment just has to be the one where the stacker transport path portion 8 is mounted in or demounted or separated from the bill receiving and dispensing apparatus 1 by a mounting/demounting means including a holding mechanism. In particular, it becomes possible to change the placement of the stacker transport path portion in accordance with the operation of a clerk, by adopting the structure where the stacker transport path portion 8 that has been handled as a component integral with either of the upper unit 1a and the lower unit 1b is independent of both of the upper unit 1a and the lower unit 1b, and by providing a mounting/demounting means capable of mounting and demounting the stacker transport path portion to and from each of the upper unit 1a and the lower unit 1b, thereby enabling improvement of the operation efficiency of the clerk.

[0057] Further, the present embodiment just has to be the one which comprises a mounting/demounting means so that the stacker transport path portion 8 is mounted in and demounted from or separated from the tray 9, or the stacker transport path portion 8 is mounted in and demounted from or separated from the safe 10. In particular, it becomes possible to facilitate the removing operation of a jamming bill when the stacker transport path portion 8 is drawn out as the lower unit 1b, by providing a mounting/demounting means which enables mounting/demounting of the stacker transport path portion 8 within the safe 10, without providing a plurality of connection transport paths 57 in the safe 10.

[0058] More specifically, the present invention just has to be the one in which only the tray 9 is drawn out while leaving the stacker transport path portion 8 in the safe

10 of the bill receiving and dispensing apparatus 1 when mounting/demounting the stackers 71a to 71d and the storage specific box 61, and in which the tray 9 and the transport path 8 above the stackers are integrally drawn out when dealing with an abnormality such as a jam. By these features, it becomes possible to improve the operation efficiency of the clerk by improving the stacker mounting/demounting operability and the maintainability during removal of a jam or the like.

[0059] It should be further understood by those skilled in the art that although the foregoing description has been made on embodiments of the invention, the invention is not limited thereto and various changes and modifications may be made without departing from the spirit of the invention and the scope of the appended claims.

Claims

1. A bill receiving and dispensing apparatus comprising:

a receiving/dispensing port through which a bill put in is received or a bill is discharged;
 a bill determination section which determines a bill;
 a temporary storage box which temporarily stores the bill received through the receiving/dispensing port;
 a stacker which stores the received bill and/or the bill to be discharged;
 a stacker transport path portion including a first bill transport path through which a bill is transported from the stacker and/or a bill is transported to the stacker;
 a second bill transport path through which a bill is transported to the receiving/dispensing port, the bill determination section, the temporary storage box and the first bill transport path of the stacker transport path portion; and
 a mounting/demounting means which mounts and demounts the stacker transport path portion.

2. The bill receiving and dispensing apparatus according to claim 1, further comprising a tray which accommodates the stacker, wherein the mounting/demounting means includes a first mounting/demounting means which mounts the stacker transport path portion to the tray and demounts the stacker transport path portion from the tray.

3. The bill receiving and dispensing apparatus according to claim 1, further comprising a safe, wherein the mounting/demounting means includes a second mounting/demounting means which mounts the stacker transport path portion to the safe and demounts the stacker transport path portion from the

safe.

4. The bill receiving and dispensing apparatus according to claim 3, wherein the second mounting/demounting means mounts the stacker transport path portion in the interior of the safe, and demounts the stacker transport path portion from the interior of the safe.

5. The bill receiving and dispensing apparatus according to claim 3, further comprising a control means which exclusively controls inhibition or permission of the mounting and demounting by the first mounting/demounting means, and the mounting and demounting by the second mounting/demounting means.

6. The bill receiving and dispensing apparatus according to claim 1, wherein the stacker transport path portion is disposed above the tray.

7. The bill receiving and dispensing apparatus according to claim 1, further comprising:

an upper unit including the receiving/dispensing port, the bill determination section, the temporary storage box and the second bill transport path;
 a lower unit including the stacker, a tray which accommodates the stacker and the stacker transport path portion; and
 a safe which houses the lower unit, wherein the mounting/demounting means mounts the stacker transport path portion to the tray and demounts the stacker transport path portion from the tray.

8. The bill receiving and dispensing apparatus according to claim 7, wherein the mounting/demounting means mounts the stacker transport path portion to the safe and demounts the stacker transport path portion from the safe.

9. An automatic cash transaction apparatus comprising the bill receiving and dispensing apparatus according to claim 1.

FIG. 1

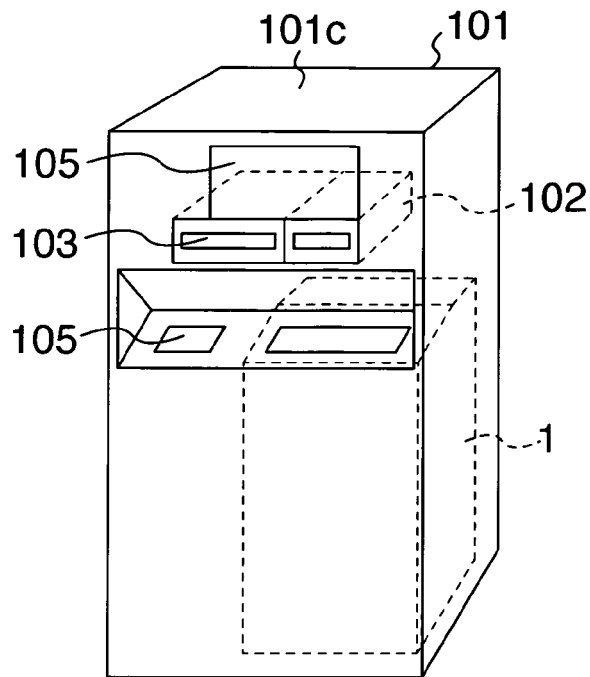


FIG. 2

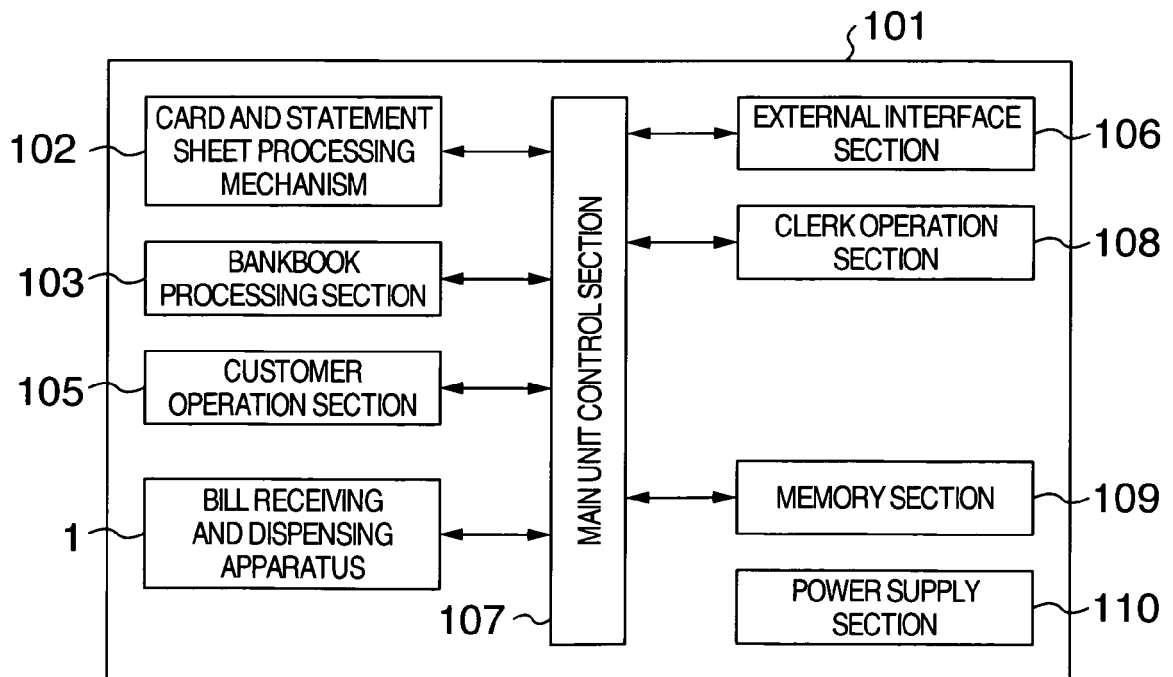


FIG. 3

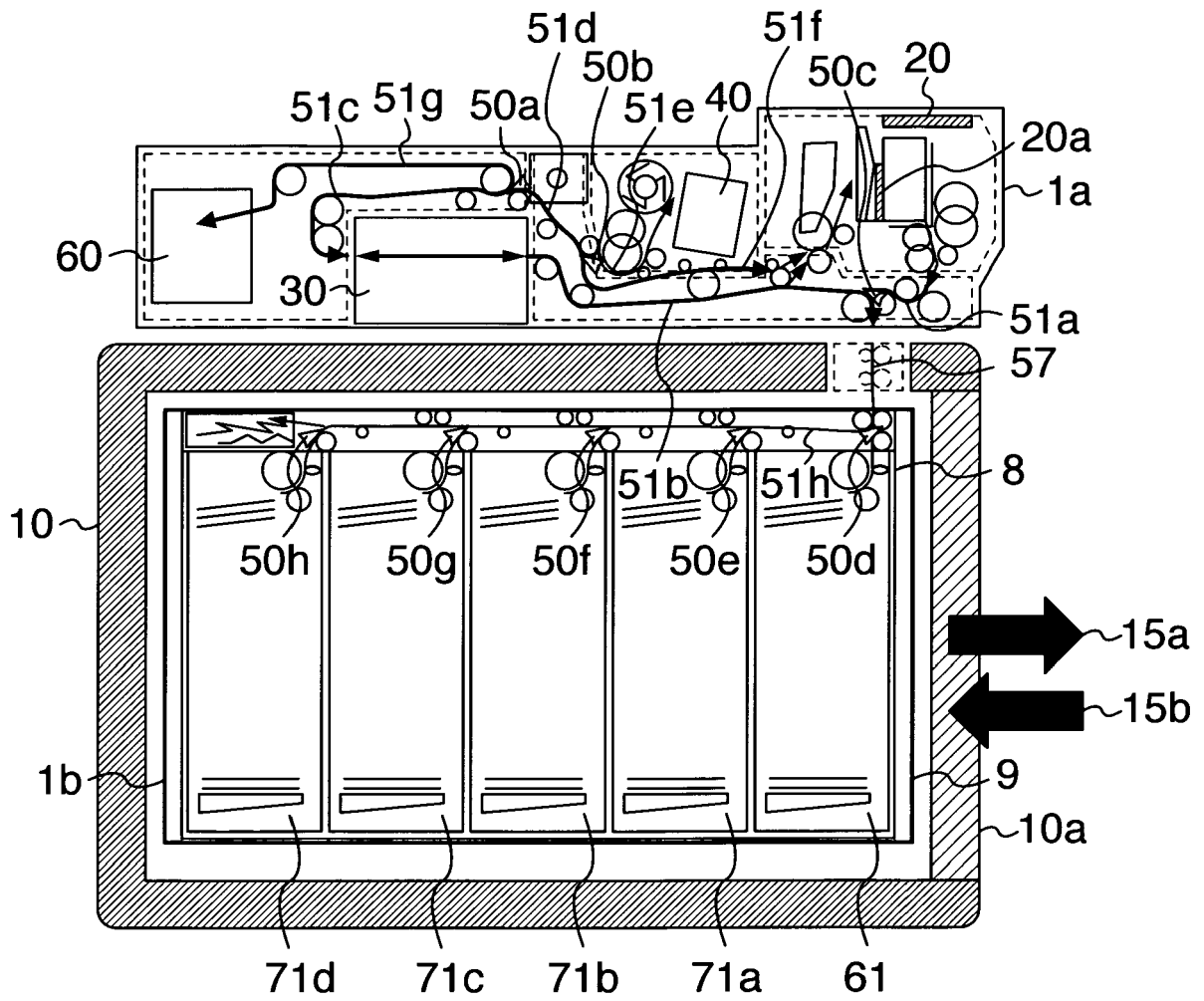


FIG. 4

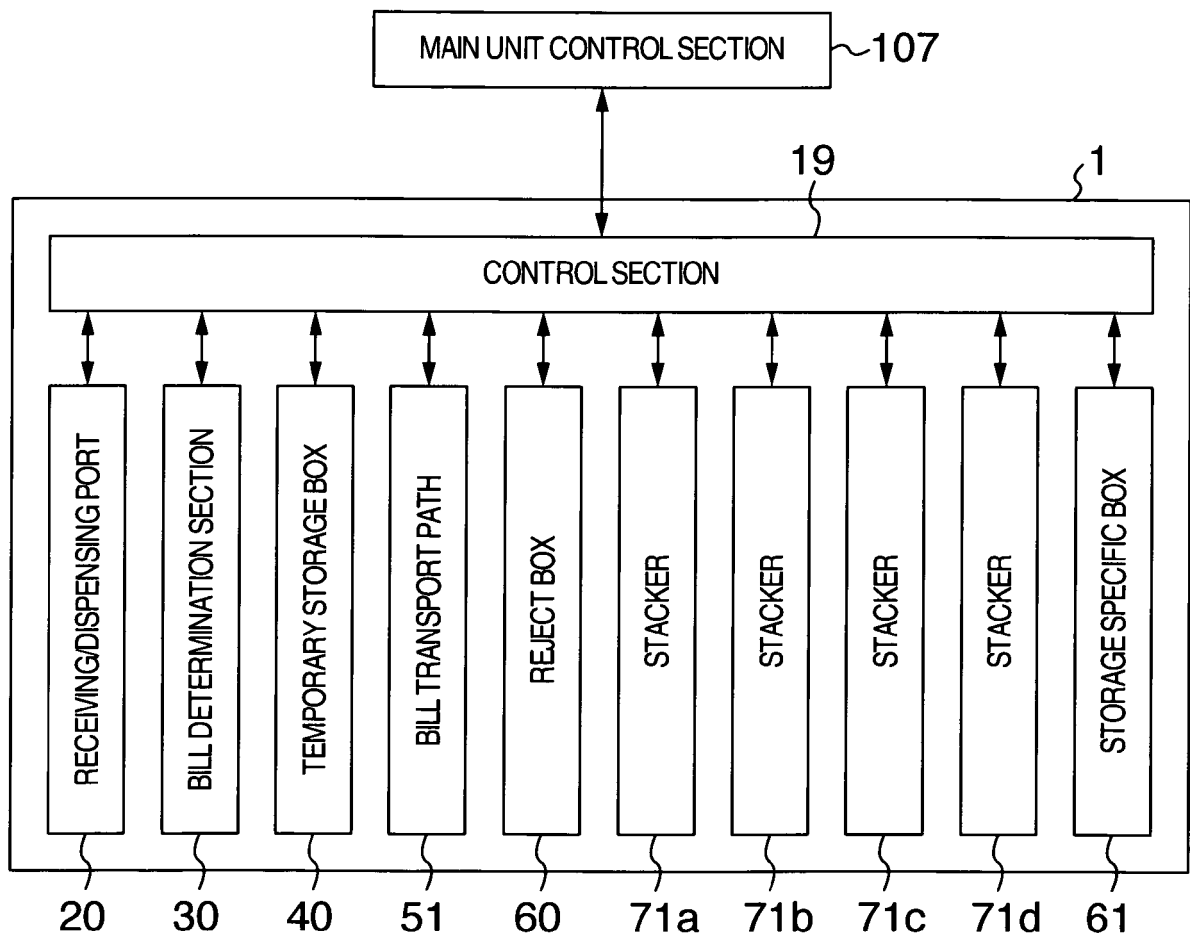


FIG. 5

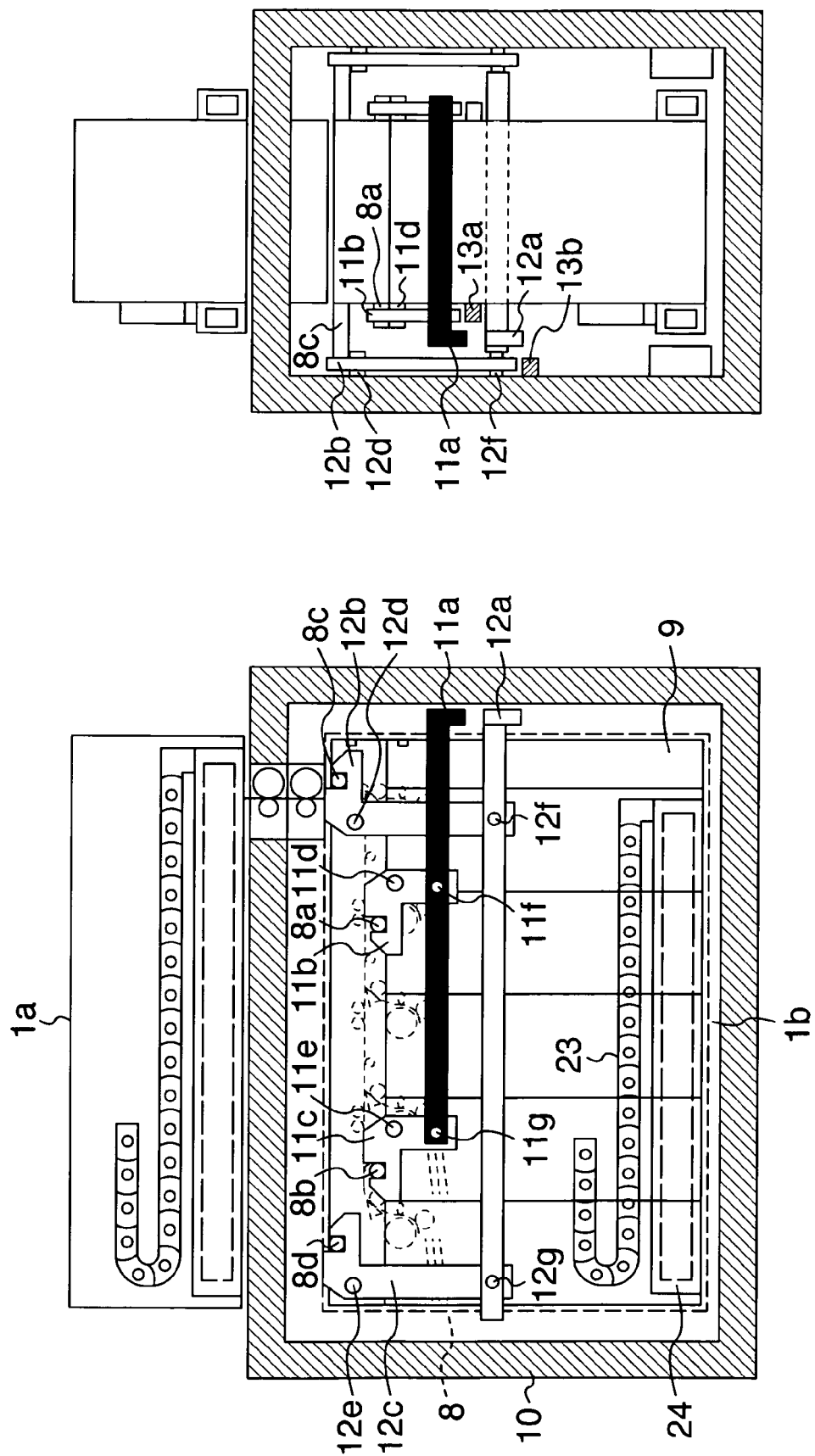


FIG. 6

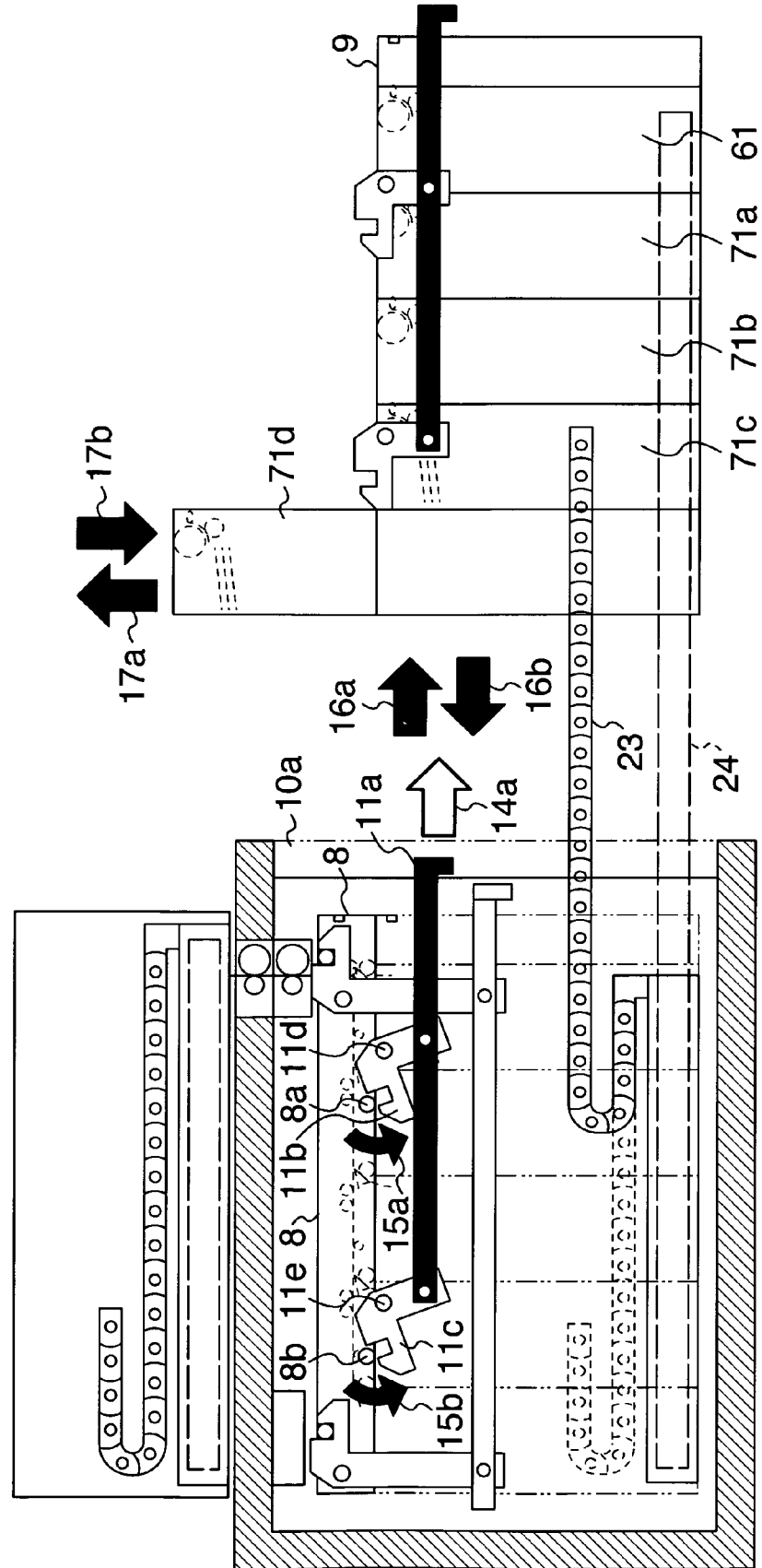


FIG. 7A
(SIDE VIEW)

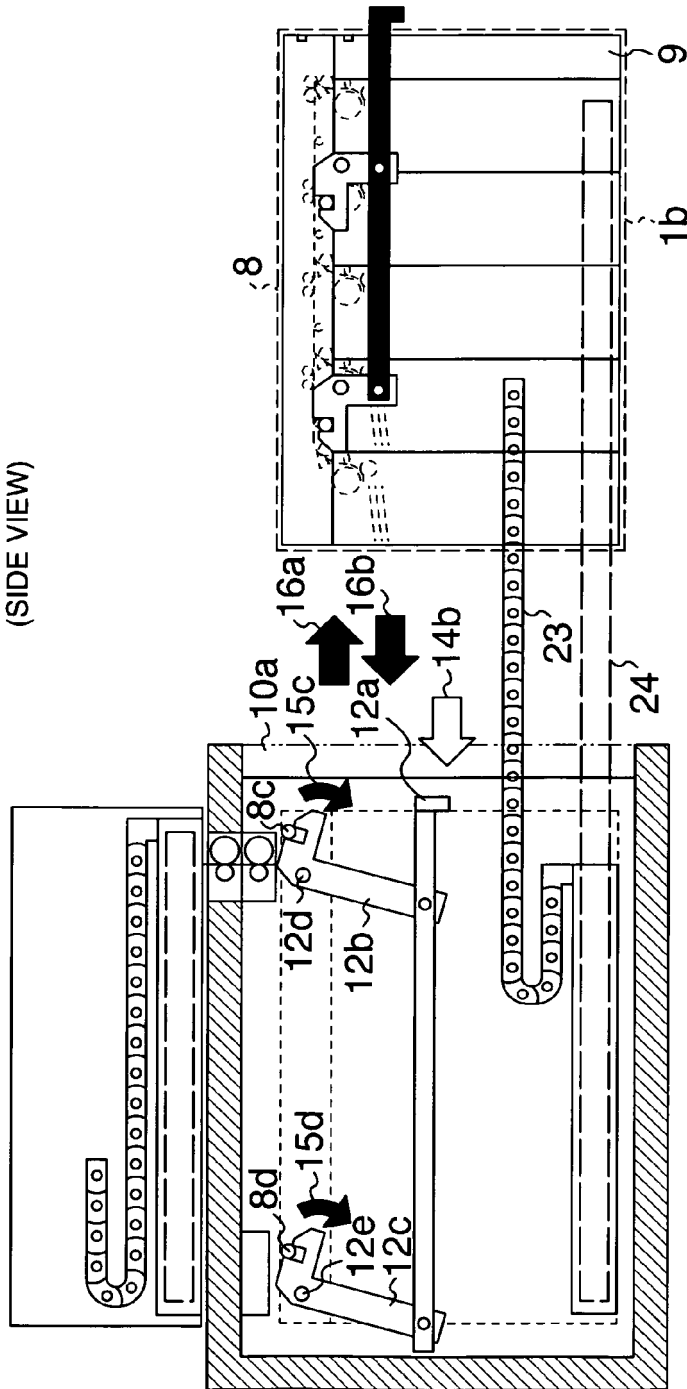


FIG. 7B
(FRONT VIEW)

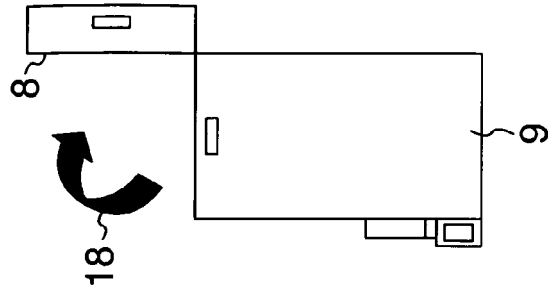
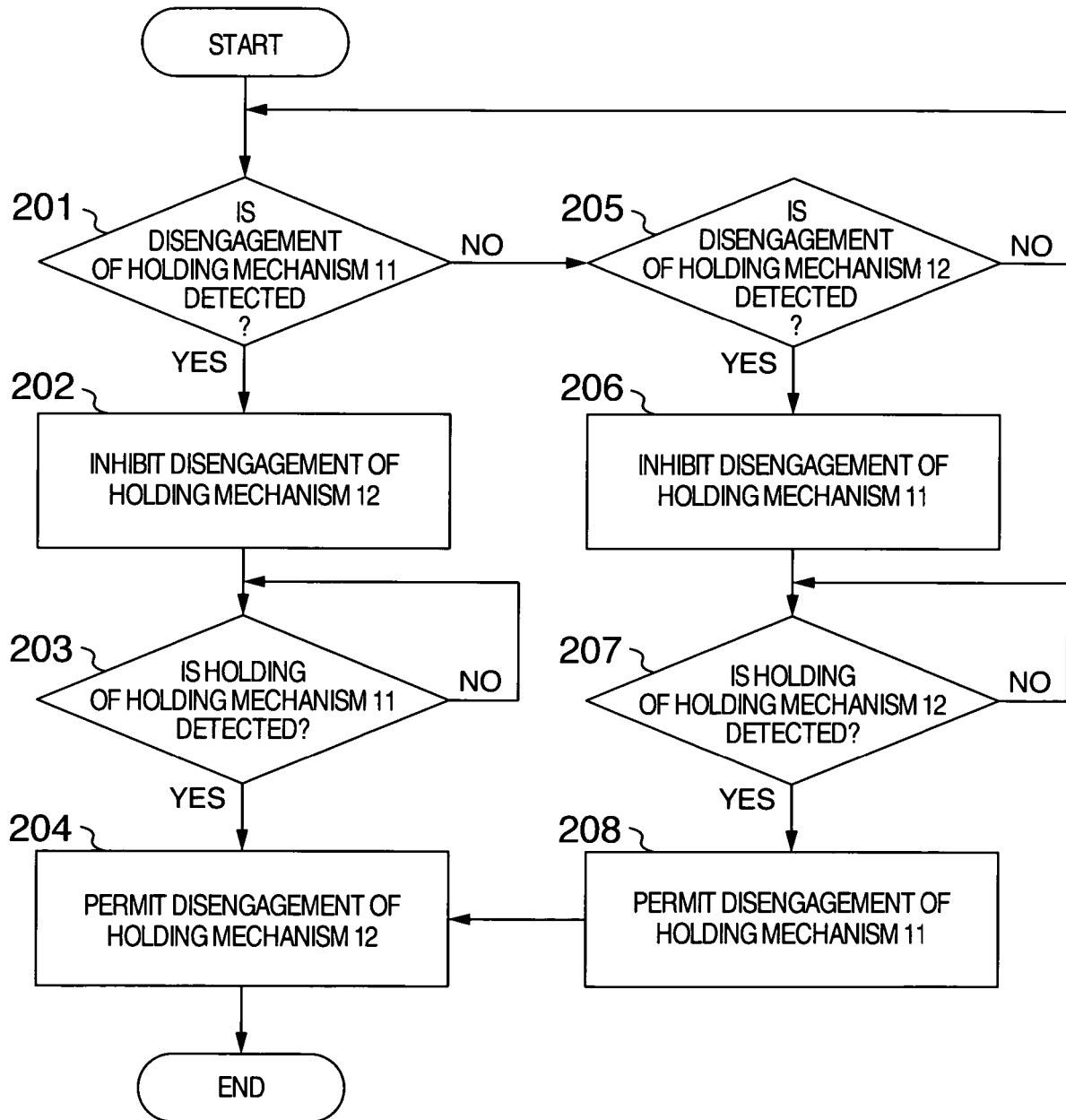


FIG. 8





EUROPEAN SEARCH REPORT

Application Number
EP 09 00 7087

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 September 2009	Examiner Diepstraten, Marc
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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