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(54) **BANKNOTE PROCESSING APPARATUS**

(57) A banknote processing apparatus includes an identification unit for identifying authentication and fitness of a deposited banknote, a setting unit for performing a setting whether or not to include a specific damaged banknote into calculation of a deposit amount, the spe-

cific damaged banknote being found true as the identification result and having a specific damage, and a calculation unit for calculating the deposit amount of the deposited banknote based on the identification result by the identification unit and the setting.

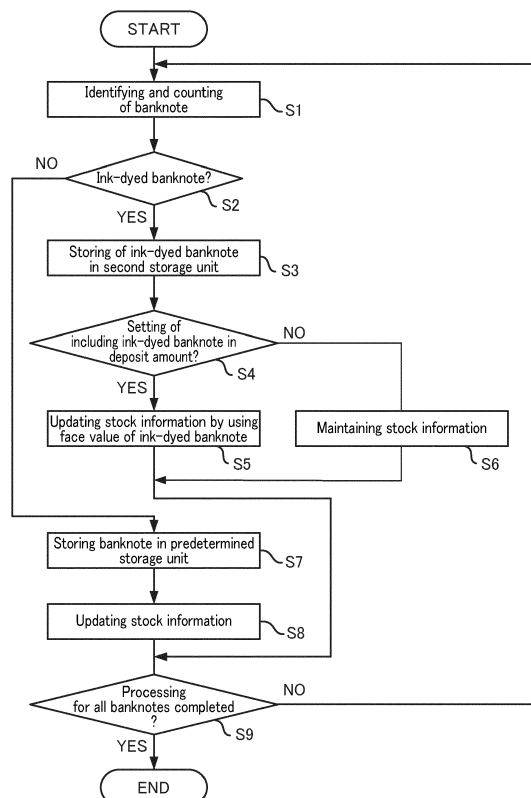


FIG. 3

Description

Technical Field

[0001] The present disclosure relates to a banknote processing apparatus for performing processing related to depositing or discharging of a banknote.

Background Art

[0002] A banknote processing apparatus is becoming pervasive, a banknote processing apparatus performs receiving the deposit of the banknote, identifies the banknote and classifies it into a plurality of categories, stores the banknote in a plurality of storage units for each category, and discharging the banknote of the requested category when a discharge request is received. Examples of the category include fit note, unfit note, counterfeit note, and suspect note. The suspect note is a banknote which the distinction of authentication cannot be clearly judged and which is suspected as the counterfeit note.

[0003] PTL 1 discloses a transaction system comprising a storage for storing banknote by denomination in a state in which the fit note and the unfit note are mixed, and a memory unit for memorizing the order of the fit note and unfit note stored in the storage. In the transaction system disclosed in PTL 1, only the fit note is discharged from the storage based on the memorized order of the fit note, at the time of transaction.

Citation List

Patent Literature

[0004] PTL1
Japanese Patent Application Laid-Open No. 2013-134569

Summary of Invention

Technical Problem

[0005] There is a banknote had a special ink adhered among some stolen banknotes. Such special ink is injected against the banknote in a safe, when an Automated Teller Machine (ATM: Automated Teller Machine) or a Cash Dispenser (CD: Automated Teller Machine) is stolen and the safe is opened illegally.

[0006] There is a banknote processing apparatus being capable of identifying a banknote to which such a special ink is adhered, as a banknote that may have been stolen, by distinguishing from the unfit note due to mere fouling. However, in many countries and regions, there is no unified view as to the category in which banknote to which special ink is adhered should be classified. Therefore, there arises a problem as to whether or not the banknote to which special ink is adhered should be included into calculation of a deposit amount, when the

banknote to which special ink is adhered is used in the banknote processing apparatus.

[0007] In consideration of such circumstances, the object of the present disclosure is to provide a banknote processing apparatus capable of suitably handling even banknote to which special ink is adhered.

Solution to Problem

[0008] A banknote processing apparatus according to the present disclosure comprises an identification unit for identifying authentication and fitness of a deposited banknote, a setting unit for performing a setting whether or not to include a specific damaged banknote into calculation of a deposit amount, the specific damaged banknote being found true as the identification result and having a specific damage, and a calculation unit for calculating the deposit amount of the deposited banknote based on the identification result by the identification unit and the setting.

[0009] The banknote processing apparatus of the present disclosure may further comprise a storage unit for storing the deposited banknote, and a control unit for controlling the storage unit to store the specific damaged banknote together with another damaged banknote when the setting unit has made setting to include the specific damaged banknote by the setting unit, and to store the specific damaged banknote separately from another banknote when it is not set to include the specific damaged banknote.

[0010] In the banknote processing apparatus of the present disclosure, the control unit may cause the specific damaged banknote to store together with a banknote suspected of being a counterfeit note when it is not set to include by the setting unit.

[0011] In the banknote processing apparatus of the present disclosure, the banknote having the predetermined feature may be an ink-dyed banknote to which a special ink is adhered.

[0012] The banknote processing apparatus of the present disclosure may further comprise an operation unit for receiving an operation for defining the setting.

[0013] The banknote processing apparatus of the present disclosure may further comprise a memory unit for memorizing the setting that has been previously determined.

[0014] The banknote processing apparatus of the present disclosure may further comprise a discharge unit for discharging the banknote, an instruction receiving unit for receiving an instruction for discharging the specific damaged banknote, and a conveyance unit for conveying only the specific damaged banknote to the discharge unit when the instruction is received.

[0015] The banknote processing apparatus of the present disclosure may further comprise a temporary reserve unit for temporarily reserving a banknote, wherein the conveyance unit may convey the specific damaged banknote from the storage unit to the discharge unit when

the instruction is received, and may convey a banknote other than the specific damaged banknote from the storage unit to the temporary reserve unit.

[0016] In the banknote processing apparatus of the present disclosure, the conveyance unit may convey the banknote other than the specific damaged banknote reserved in the temporary reserve unit to the storage unit after the discharge of the specific damaged banknote is completed.

[0017] A banknote processing apparatus comprises an identification unit for identifying whether or not a deposited banknote has a predetermined feature, a storage unit for storing the banknote identified by the identification unit regardless of the presence or absence of the feature, and a calculation unit for calculating the deposit amount of the deposited banknote based on a setting of whether or not to include a banknote having the predetermined feature among the banknotes stored in the storage unit into calculation of the deposit amount of the deposited banknote.

[0018] In the banknote processing apparatus according to claim 10, the banknote having the predetermined feature may be an ink-dyed banknote to which a special ink is adhered.

Advantageous Effects of Invention

[0019] According to a banknote processing apparatus of the present disclosure, it is possible to appropriately change whether or not to include a specific damaged banknote whose handling is not fixed in the deposit amount, and to cope with it flexibly.

Brief Description of Drawings

[0020]

FIG. 1 is a diagram illustrating an example of a configuration of a banknote processing apparatus according to an embodiment of the present disclosure; FIG. 2 is a diagram illustrating an example of a configuration of a banknote processing apparatus using functional blocks;

FIG. 3 is a flowchart for explaining an example of the deposit processing; and

FIG. 4 is a flowchart for explaining an example of discharge processing.

Description of Embodiments

[0021] Hereinafter, embodiments of the present disclosure will be described in detail with reference to the drawings. However, there are cases where a more detailed description than necessary, for example, a detailed description of already well-known matters, a duplicated description of substantially the same configuration, and the like are omitted. Also, the following description and referenced drawings are provided to the person skilled in

the art in order to understand the subject matter and are not intended to limit the scope of the claims.

[0022] In the following description, the term "front" of the banknote processing apparatus means a side on which an opening for performing at least one operation of inserting and discharging the banknote is provided. The term "left" of the banknote processing apparatus means the left side toward the side on which the opening is provided, and the term "right" of the banknote processing apparatus means the right side toward the side on which the opening is provided.

(1) Configuration of banknote processing apparatus

[0023] FIG. 1 is a diagram illustrating an example of a configuration of a banknote processing apparatus 1 according to an embodiment of the present disclosure. The left side of FIG. 1 is the front side of the banknote processing apparatus 1, and the right side of FIG. 1 is the rear side of the banknote processing apparatus 1. The banknote processing apparatus 1 is installed in a bank teller counter, or a back office such as a store, a government office, or a station. The banknote processing apparatus 1 is used by a bank teller, a person in charge, a responsible person, a manager, or the like of a facility such as a store, a government office, a station, or the like. In the following description, the person in charge, the responsible person, the manager, or the like of the facility in which the banknote processing apparatus 1 is installed will be referred to as the administrator of the banknote processing apparatus 1.

[0024] The banknote processing apparatus 1 is an apparatus for receiving and discharging banknotes. The banknote processing apparatus 1 comprises a processing unit 10 and a storage box 20 provided below the processing unit 10. In the embodiment of the present invention, the banknote processing apparatus 1 that handles a banknote is described, however, the present invention is not limited to this, and securities other than the banknote, such as check, may be handled.

[0025] The processing unit 10 comprises a deposit unit 12, a discharge unit 13, a rejection unit 14, a conveyance unit 15, an identification unit 16, a temporary reserve unit 17, a control unit 18, an operation unit 19, and a memory unit 110. These configurations constituting the processing unit 10 are disposed on the inner or outer surface of the upper housing 11.

[0026] A deposit port (opening) 121 and a discharge port (opening) 131 are provided in front of the upper housing 11. The deposit port 121 is connected to a feeding mechanism (not illustrated) for feeding out the banknote one by one to the conveyance unit 15 at predetermined intervals. The deposit port 121 and the feeding mechanism constitute the deposit unit 12.

[0027] A stacking mechanism (not illustrated) for stacking the banknote is disposed in the vicinity of the discharge port 131. The discharge port 131 and the stacking mechanism constitute the discharge unit 13. Further,

the rejection unit 14 comprising the same configuration as the discharge unit 13 is provided next to the discharge unit 13.

[0028] In the example illustrated in FIG. 1, the processing unit 10 comprises the deposit unit 12 and the discharge unit 13 independently, but the present invention is not limited thereto. In the present invention, a deposit/discharge unit in which the deposit unit 12 and the discharge unit 13 are integrated may be provided. The deposit port 121 and the discharge port 131 may not necessarily be provided at the front of the upper housing 11, but may be provided at the left, right, rear, or the like of the upper housing 11. Further, the deposit port 121 and the discharge port 131 may be provided so as to open in different directions of the upper housing 11. In the front surface of the rejection unit 14, the lid (not illustrated) is provided. The lid can be opened and closed by means of an electromagnetic lock control or a key mechanism. When checking the banknote in the rejection unit 14, the administrator opens the lid using the electromagnetic lock control or the key, and takes out the banknote in the rejection unit 14.

[0029] The conveyance unit 15 conveys the banknote at a predetermined conveying speed. The conveyance unit 15 is constituted by a belt mechanism and a roller mechanism. The conveyance unit 15 comprises a loop-shaped conveyance passage 150 that allows the banknote to be conveyed in both directions, a first branch passage 151 branching from the loop-shaped conveyance passage 150, a second branch passage 152, a third branch passage 153, a fourth branch passage 154, a fifth branch passage 155, a sixth branch passage 156, and a seventh branch passage 157.

[0030] The first branch passage 151 connects the loop-shaped conveyance passage 150 and the deposit unit 12. The second branch passage 152 connects the loop-shaped conveyance passage 150 and the discharge unit 13. The third branch passage 153 connects the loop-shaped conveyance passage 150 and the temporary reserve unit 17. The fourth branch passage 154 connects the loop-shaped conveyance passage 150 and the storage box 20. The fifth branch passage 155 connects the fourth branch passage 154 and each of first storage units 22 of the storage box 20. The sixth branch passage 156 connects the loop-shaped conveyance passage 150 and a second storage unit 23. The seventh branch passage 157 connects the loop-shaped conveyance passage 150 and a third storage unit 24 of the storage box 20.

[0031] The identification unit 16 is provided in the middle of the loop-shaped conveyance passage 150, and comprises a sensor such as an image sensor, an optical sensor, a magnetic sensor, or the like. The identification unit 16 identifies genuine or counterfeit, fit or unfit, presence or absence of adhesion of a special ink, denomination, and the like of the banknote conveyed on the loop-shaped conveyance passage 150.

[0032] The special ink is, for example, ejected to the banknote in the safe, when the ATM, the CD, or the like

is stolen and the safe is opened illegally. Therefore, the banknote to which the special ink is adhered is very likely to be a stolen banknote. The property of special ink is the specific property such as predetermined composition, color, and the like, so as to be distinguishable from mere stain. Based on this specific property, the identification unit 16 can distinguish between the banknote to which the special ink is adhered and the banknote to which the simple stain is adhered. As the specific property of the special ink, a known property may be appropriately adopted.

[0033] In the following description, the banknote to which the special ink is adhered is referred to as an ink-dyed banknote. As a concrete method for the identification unit 16 to identify the denomination, category, or the like of the banknote, a known technique can be appropriately adopted.

[0034] The description returns to the configuration of the banknote processing apparatus 1. The temporary reserve unit 17 is a storage unit of the winding type, for example, such as winding the banknote together with the tape on the drum by the strip-shaped tape of which one end is attached to the outer peripheral surface of the drum. Therefore, the temporary reserve unit 17 comprises a function of taking the banknote in one by one and storing the banknote temporarily, and a function of feeding out the stored banknote one by one.

[0035] The control unit 18 comprises at least a Central Processing Unit (CPU) and a memory. The memory comprised in the control unit 18 may be the memory unit 110 or a memory device provided otherwise. The control unit 18 controls the respective configurations of the banknote processing apparatus 1 to convey the banknote among the deposit unit 12, the discharge unit 13, the rejection unit 14, the temporary reserve unit 17, and the storage box 20 via the conveyance unit 15.

[0036] The operation unit 19 receives the operation input by a user of the banknote processing apparatus 1 and outputs a signal indicating the content of the received operation input to the control unit 18. Then, the control unit 18 performs control corresponding to the operation input performed on the operation unit 19. The operation unit 19 is an example of an operation unit or an instruction receiving unit of the present disclosure. The user of the banknote processing apparatus 1 is a person who intends to perform processing by using the banknote processing apparatus 1, and may or may not be the same as the administrator of the banknote processing apparatus 1.

[0037] The memory unit 110 memorizes various types of information used when the control unit 18 controls the banknote processing apparatus 1.

[0038] The storage box 20 is a safe formed by a lower housing 21. Inside the storage box 20, a plurality of the first storage units 22, the second storage unit 23, and the third storage unit 24 are disposed. In the example illustrated in FIG. 1, four first storage units 22 are disposed. In the example illustrated in FIG. 1, a plurality of first

storage units 22, second storage unit 23, and third storage unit 24 are disposed side by side inside the storage box 20, however, this is an example, and other arrangements may be adopted appropriately.

[0039] Each of the first storage unit 22 comprises a storage area connected to the fifth branch passage 155. The storage area of the first storage unit 22 is, for example, a storage area of the stacking type in which a plurality of banknotes is stored in a stacked state. The fit note, that is an authentic banknote (genuine note), and the banknote identified as no stain or damage by the identification unit 16 is stored in the storage area of the first storage unit 22. Each of a plurality of the first storage units 22 stores the banknote of a specific denomination. As a concrete example, when four first storage units 22a to 22d are provided, the first storage unit 22a stores 1 dollar banknote, the first storage unit 22b stores 5 dollar banknote, the first storage unit 22c stores 10 dollar banknote, and the first storage unit 22d stores 20 dollar banknote. Although not illustrated in FIG. 1, one storage area of the first storage unit 22 may be divided into two so as to be able to store the banknote of different denomination respectively.

[0040] The second storage unit 23 comprises a storage area connected to the sixth branch passage 156. The second storage unit 23 is a storage unit of the winding type, for example, such as winding the banknote together with the tape on the drum by the strip-shaped tape of which one end is attached to the outer peripheral surface of the drum. Therefore, the second storage unit 23 comprises a function of taking the banknote in one by one and storing the banknote temporarily, and a function of feeding out the stored banknote one by one.

[0041] The third storage unit 24 comprises a storage area connected to the seventh branch passage 157. The storage area of the third storage unit 24 is, for example, a storage area of the stacking type in which a plurality of banknotes is stored in a stacked state.

[0042] In the storage areas of the second storage unit 23 and the third storage unit 24, the banknote identified by the identification unit 16 as not being the fit note is stored. In the contents of the disclosure, as a category of a banknote that is not the fit note, the unfit note, the counterfeit note, the suspect note, or the ink-dyed banknote is assumed. The unfit note is the genuine note, but is stained or damaged. The counterfeit note is a false note that is not the fit note, or a banknote that is likely to be the false note. The suspect note is a banknote of which distinction of authentication cannot be judged due to damage, stain, or the like and is suspected of being the counterfeit note.

[0043] The second storage unit 23 and the third storage unit 24 respectively store the banknote of different category. As described above, since the second storage unit 23 comprises a function of feeding out the stored banknote, the second storage unit 23 stores the banknote of the category that needs to be discharged later. On the other hand, in the third storage unit 24, the unfit note and

the like are stored, or the banknote that cannot be stored in the first storage unit 22 are stored regardless of the category.

[0044] The unfit note is not preferable to redistribute to the market, because, for example, the unfit note is the genuine note, but is stained or damaged to the extent that they are not suitable for distribution. Therefore, it is preferable that the unfit note is stored in the third storage unit 24 and collected.

[0045] Since the counterfeit note is likely to be a banknote concerning the crime, depending on the country or region, it may be prescribed not to return even if the customer requests to return, store in the facility where the banknote processing apparatus 1 is installed, and notify to a prescribed organization later. In such a case, it is preferable that the counterfeit note is not stored in the storage box 20, but is stored in the rejection unit 14 provided outside the storage box 20. The counterfeit note may be kept in a state capable of discharging without opening the storage box 20 by storing in the second storage unit 23 capable of feeding out.

[0046] The suspect note may be prescribed that the administrator of the banknote processing apparatus 1 must check visually whether it is the genuine note or the counterfeit note, depending on the country or region. In such a case, it is preferable that the suspect note is stored in the rejection unit 14 capable of being taken out from the outside, or the second storage unit 23 capable of feeding out.

[0047] Handling of the ink-dyed banknote is not a unified view in many countries and regions. For this reason, in the banknote processing apparatus 1 according to the present embodiment, the ink-dyed banknote is stored in the rejection unit 14 or the second storage unit 23 together with the suspect note so as to cope with a case of being necessary for the administrator to discharge and check the ink-dyed banknote.

[0048] In the banknote processing apparatus 1, it is possible to appropriately change which category of the banknote is stored in which storage unit. For example, when the banknote processing apparatus 1 is not a self machine but a teller machine, since the staff may discharge and check the collected counterfeit note from the banknote processing apparatus 1, the counterfeit note may be stored in the second storage unit 23 capable of feeding out. The teller machine is a banknote processing apparatus operated by a bank staff or the like. The self machine is banknote processing apparatus operated by a user who requests depositing or discharging by himself/herself, not the staff.

[0049] As described above, the banknote processing apparatus 1 according to the embodiment of the present disclosure comprises the rejection unit 14 that stores the banknote outside the storage box 20 in a state that the banknote can be taken out, and the second storage unit 23 that comprises a function of storing the banknote one by one and a function of feeding out the banknote one by one. With such a configuration, concerning the ink-

dyed banknote and suspect note that need to be checked by the administrator are stored in the rejection unit 14 or the second storage unit 23, so that the ink-dyed banknote and suspect note can be discharged without opening the door of the storage box 20 even after they have been deposited once. In the following processing, a description will be performed by exemplifying a form in which a specific damaged banknote is stored in the second storage unit.

(2) Deposit processing

[0050] The deposit processing will be described below. The deposit processing is a processing of feeding out the banknote deposited to the deposit unit 12 from the deposit unit 12, identifying the banknote conveyed by the conveyance unit 15 by the identification unit 16, determining the amount calculated based on an identification result as the deposit amount, and storing the banknote in any one of the plurality of first storage units 22, the second storage unit 23, or the third storage unit 24 in the storage box 20. When the deposit processing is completed, the stock information indicating the stock in the storage box 20 is updated based on the established amount of money. The stock information is memorized in the memory unit 110.

[0051] First, the configuration of the banknote processing apparatus 1 will be described. FIG. 2 is a diagram illustrating an example of the configuration of the banknote processing apparatus 1 using functional blocks. As illustrated in FIG. 2, the control unit 18 comprises a setting unit 181 and a calculation unit 182. Further, the control unit 18 controls the conveyance unit 15, the identification unit 16, the temporary reserve unit 17, the operation unit 19, the memory unit 110, the first storage unit 22, the second storage unit 23, and the third storage unit 24.

[0052] The setting unit 181 sets whether or not to include the ink-dyed banknote into calculation of the deposit amount when the ink-dyed banknote is deposited in the banknote processing apparatus 1. The setting unit 181 sets whether or not the ink-dyed banknote to include into calculation of the deposit amount based on an operation performed via the operation unit 19. In other words, the setting unit 181 sets whether or not the ink-dyed banknote to include into calculation of the deposit amount by the operation performed of defining the setting content via the operation unit 19. The operation of defining the setting content may be performed by a manufacturer before the start of the deposit processing, such as at the time of manufacturing the banknote processing apparatus 1, or in a standby state waiting for the start of the deposit processing. Alternatively, the setting operation may be performed by the administrator of the banknote processing apparatus 1 at the start of the deposit processing or during the deposit processing.

[0053] The setting unit 181 generates setting information indicating the setting contents. The setting information

generated by the setting unit 181 is memorized in the memory unit 110.

[0054] The calculation unit 182 calculates the total amount of the face value of the banknote deposited in the deposit processing as the deposit amount. At this time, the calculation unit 182 refers to the setting information, and when it is set that the ink-dyed banknote is included into calculation of the deposit amount, the face value of the ink-dyed banknote is included into calculation of the deposit amount, and if not, the ink-dyed banknote is not included in the deposit amount.

[0055] The calculation unit 182 updates the stock information memorized in the memory unit 110 in advance, based on the calculated deposit amount. The stock information is information indicating the total amount of the banknote to be included into calculation of the deposit amount among the banknote stored in the storage box 20. That is, the stock information does not contain the face value of the banknote stored in the temporary reserve unit 17.

[0056] Hereinafter, how the deposit processing is performed by the banknote processing apparatus 1 will be described in detail. FIG. 3 is a flowchart for explaining an example of the deposit processing.

[0057] When the user performs an operation of depositing a banknote into the deposit unit 12 and performs an operation input of starting a deposit processing via the operation unit 19, the deposit processing of the banknote processing apparatus 1 is started. In the following description, it is assumed that the plurality of banknotes is deposited by the user.

[0058] In step S1, the control unit 18 conveys one of the plurality of banknotes deposited into the deposit unit 12 to the identification unit 16 via the first branch passage 151 and the loop-shaped conveyance passage 150, and causes the identification unit 16 to perform identification and count. In the following description, this one banknote may be referred to as a target banknote.

[0059] In step S2, the control unit 18 determines whether or not the target banknote is the ink-dyed banknote based on the identification result by the identification unit 16. When it is determined that the target banknote is the ink-dyed banknote (step S2: YES), the control unit 18 advances the processing to step S3, and when not (step S2: NO), advances the processing to step S7.

[0060] In step S3, the control unit 18 controls the conveyance unit 15 to convey the target banknote, which is the ink-dyed banknote, to the second storage unit 23, and store it. In step S3, the control unit 18 causes the second storage unit 23 to store the target banknote, generates identification information for identifying the target banknote, and memorizes the identification information in the memory unit 110. The identification information is information indicating the n-th position of the ink-dyed banknote in the stack of banknotes stored in the second storage unit 23. With such identification information, the control unit 18 can distinguish a banknote other than the ink-dyed banknote, which is a suspect banknote in the

present embodiment, stored in the second storage unit 23 from the ink-dyed banknote.

[0061] In step S4, the control unit 18 refers to the setting information memorized in the memory unit 110, and determines whether or not the setting of including the ink-dyed banknote into calculation of the deposit amount has been made. When the setting as to whether or not to include the ink-dyed banknote into calculation of the deposit amount has not been made in advance, the control unit 18 causes the user to perform the setting as this point in time, by displaying a message on a display unit (not illustrated) such as "The ink-dyed banknote has been found. Is it to be included into calculation of the deposit amount?" and options such as "Yes" and "No", and causing the user may to select the options by the operation unit 19.

[0062] When the setting of including the ink-dyed banknote into calculation of the deposit amount has been made (step S4: YES), the control unit 18 advances the process to step S5, and when not (step S4:NO), advances the process to step S6.

[0063] In step S5, the calculation unit 182 of the control unit 18 includes the face value of the target banknote into calculation of the deposit amount, and updates the stock information. The stock information is information indicating the total amount of the banknote to be included into calculation of the deposit amount among the banknote stored in the storage box 20. The banknote to be included into calculation of the deposit amount is the fit note, the unfit note, the suspect note, and the ink-dyed banknote when the setting of including the ink-dyed banknote into calculation of the deposit amount is performed. When the setting of including the ink-dyed banknote into calculation of the deposit amount is not performed, the banknote to be included into calculation of the deposit amount is the fit note, the unfit note, or the suspect note. Note that the face value of the suspect note may not be included in the stock information.

[0064] In step S6, the calculation unit 182 of the control unit 18 maintains the stock information, because the setting of including the ink-dyed banknote into calculation of the deposit amount is performed.

[0065] When the processing of step S5 or S6 is completed, the control unit 18 advances the processing to step S9.

[0066] When it is determined that the target banknote is not the ink-dyed banknote in step S2, in step S7, the control unit 18 controls the conveyance unit 15 to convey the target banknote to a predetermined storage unit and store it. The predetermined storage unit is a storage unit which is set in advance for each denomination or category. To give a concrete example, the fit note is stored in the storage unit corresponding to the denomination of the first storage unit 22, the unfit note is stored in the third storage unit 24, the suspect note is stored in the second storage unit 23, and the counterfeit note is stored in the rejection unit 14.

[0067] In step S8, when the target banknote is the fit

note, the unfit note, or the suspect note, the calculation unit 182 includes the face value of the target banknote into calculation of the deposit amount and updates the stock information. On the other hand, when the target banknote is the counterfeit note, the calculation unit 182 does not include the face value of the target banknote into calculation of the deposit amount, and maintains the stock information.

[0068] In step S9, the control unit 18 determines whether or not the processing of steps S1 to S8 has been completed for all the deposited banknotes. When it is determined that the processing has been completed for all the banknotes (step S9: YES), the control unit 18 ends the deposit processing, and when not (step S9: NO), the control unit 18 returns the processing to step S1, and continues the deposit processing for the next banknote.

[0069] According to the deposit processing described above, it is possible to appropriately change whether or not to include the ink-dyed banknote into calculation of the deposit amount based on the setting of the user or the administrator. In addition, in the deposit processing described above, the identification information for distinguishing the ink-dyed banknote stored in the second storage unit 23 from the banknote of other category, i.e., the suspect note in the example described above, is generated. The identification information is used when the banknote stored in the second storage unit 23 is discharged in a discharge processing described later. The only ink-dyed banknote can be discharged by generating the identification information.

(3) Discharge processing

[0070] Next, the discharge processing will be described. The discharge processing is a process of discharging the banknote stored in the second storage unit 23 based on a request or the like from the user to the operation unit 19.

[0071] FIG. 4 is a flowchart for explaining an example of the discharge processing.

[0072] In step S11, the control unit 18 receives an operation input of an instruction to start the discharge processing via the operation unit 19 by the user.

[0073] In step S12, the control unit 18 determines whether the instruction by the user in step S11 is an instruction to discharge only the ink-dyed banknote or an instruction to discharge all the banknotes stored in the second storage unit 23 containing the ink-dyed banknote. Note that all the banknotes stored in the second storage unit 23 contains the ink-dyed banknote and the suspect note.

[0074] The instruction to discharge only the ink-dyed banknote is performed, for example, when the user wants to discharge only the ink-dyed banknote and visually check it. On the other hand, the instruction to discharge all the banknotes stored in the second storage unit 23 is performed when the user wants to visually check all suspect note for which the distinction of authentication can-

not be clearly determined.

[0075] If it is determined in step S12 that the instruction is to discharge only the ink-dyed banknote (step S12: YES), the control unit 18 advances the process to step S13, and if not (step S12: NO), advances the process to step S16.

[0076] In step S13, the control unit 18 feeds out the banknote from the second storage unit 23, and causes the conveyance unit 15 to convey and discharge the ink-dyed banknote among the fed out banknote to the discharge port 131, and to convey the other banknote (suspect note) to the temporary reserve unit 17 and store it. At this time, which of the banknote fed out from the second storage unit 23 is the ink-dyed banknote is identified based on the identification information memorized in the memory unit 110.

[0077] In step S14, the control unit 18 determines whether or not the discharge is completed. When it is determined that the discharge is completed (step S14: YES), the control unit 18 advances the process to step S15, and when not (step S14: NO), returns the processing to step S13.

[0078] When the discharge is completed, in step S15, the control unit 18 returns the suspect note stored in the temporary reserve unit 17 to the second storage unit 23. Thus, the discharge processing has been completed.

[0079] On the other hand, in step S16, the control unit 18 causes the second storage unit 23 to feed out the banknote, and causes the conveyance unit 15 to convey and discharge all the fed out banknotes to the discharge port 131.

[0080] In step S17, the control unit 18 determines whether or not the discharge is completed. When it is determined that the discharge is completed (step S17: YES), the control unit 18 ends the discharge processing, and when not (step S17: NO), returns the processing to step S16.

[0081] As described above, in the discharge processing of the banknote processing apparatus 1, only the ink-dyed banknote among the ink-dyed banknote and the suspect banknote stored in the second storage unit 23 can be discharged based on the identification information generated in the deposit processing. In the deposit processing and the discharge processing described above, the embodiment in which the ink-dyed banknote is stored in the second storage unit 23 has been described as an example. However, as described above, when it is set that the ink-dyed banknote is not included into calculation of the deposit amount, the ink-dyed banknote may be stored in the rejection unit 14 together with the counterfeit note.

<Modifications>

[0082] The deposit processing and discharge processing described above are merely examples, and the present disclosure is not limited thereto. Hereinafter, a modification of the deposit processing or the discharge

processing will be described.

(Variation of deposit processing)

[0083] In the above-described deposit processing, a case has been described in which it is determined in advance that the fit note is stored in the first storage unit 22, the ink-dyed banknote and the suspect note are stored in the second storage unit 23, and the unfit note is stored in the third storage unit 24. However, in the content of the present disclosure, the storage unit in which the ink-dyed banknote is stored is not particularly limited.

[0084] For example, as described above, the ink-dyed banknote may be stored in the rejection unit 14 together with the counterfeit note. The ink-dyed banknote may be stored in the third storage unit 24. In this case, the ink-dyed banknote is stored together with the unfit note. The ink-dyed banknote stored in the third storage unit 24 is not visually checked by the administrator, but is collected by a banknote issuing organization such as a central bank and the like.

[0085] Further, the ink-dyed banknote may be stored in the first storage unit 22 together with the fit note. Further, when the banknote processing apparatus 1 receives a sheet which cannot be identified as the banknote, the ink-dyed banknote may be stored in, for example, another storage unit (not illustrated), together with the sheet which cannot identify as the banknote. However, in this case, since there is a high possibility that trouble occurs at the time of discharge such as chaining or skewing, it is preferable to store the ink-dyed banknote together with the sheet which cannot be identified as the banknote, only when the occurrence of the trouble is permitted to some extent.

[0086] Further, the storage destination of the ink-dyed banknote may be appropriately changed based on the setting as to whether or not to include the ink-dyed banknote into calculation of the deposit amount. For example, when it is set to include the ink-dyed banknote into calculation of the deposit amount, the same handling as that of the unfit note may be performed by storing in the third storage unit 24 same as the unfit note. When it is not set not to include the ink-dyed banknote into calculation of the deposit amount, the ink-dyed banknote may be stored in the second storage unit 23 same as the suspect note, or may be stored in the rejection unit 14 same as the counterfeit note.

[0087] The change of the storage destination of the ink-dyed banknote is performed, for example, based on the storage destination information memorized in the memory unit 110. The storage destination information is information indicating the storage destination of the ink-dyed banknote set by, for example, the administrator of the banknote processing apparatus 1. The storage destination information is memorized in advance in the memory unit 110 before the operation of the banknote processing apparatus 1, i.e., before receiving the deposit

processing. Alternatively, the storage destination is checked at the start of the deposit processing or during the processing, and at the time when the storage destination is received by the operation of the administrator via the operation unit 19, the storage destination information may be generated

(Variation of Discharge Processing)

[0088] In the above-described discharge processing, a case has been described in which only the ink-dyed banknote or all of the banknotes stored in the storage unit 23 are discharged, but the present disclosure is not limited thereto. For example, the discharge processing of discharging only the suspect note from the second storage unit 23 in which the ink-dyed banknote and the suspect note are stored can be realized. In this case, the control unit 18 may control the conveyance unit 15 based on the identification information to convey the ink-dyed banknote to the temporary reserve unit 17 and to convey the other banknote to the discharge unit 13.

[0089] In addition, the identification process performed in the deposit processing may be performed again in the discharge processing of the ink-dyed banknote. In this case, the control unit 18 controls the conveyance unit 15 to convey the ink-dyed banknote fed out from the second storage unit 23 to the discharge unit 13 via the identification unit 16. By such processing, the following effects can be obtained.

[0090] As an example of the identification operation in the identification unit 16, an operation of irradiating light or the like of a predetermined wavelength with respect to a predetermined area of the banknote in a state of being placed on the belt or the like constituting the conveyance unit 15 is exemplified. In such an identification operation, when the dying ink does not adhere to a predetermined area occasionally, it may be impossible to identify as the ink-dyed banknote. Since the position of the banknote on the belt is not always the same every time, even the banknote identified as the ink-dyed banknote in the deposit processing may not be identified as the ink-dyed banknote in the deposit processing.

[0091] In such a case, the control unit 18 causes a display unit (not illustrated) to display a message such as "This banknote may not be an ink-dyed banknote. Please check it visually.", and causes the administrator to check whether or not it is the ink-dyed banknote. In this manner, when the identification operation is also performed during the discharge processing, it is preferable because the accuracy of identifying whether or not it is the ink-dyed banknote is improved.

<Effects>

[0092] As described above, the banknote processing apparatus 1 according to the embodiment of the present disclosure comprises the identification unit 16 for identifying authentication and fitness of the deposited banknote,

the setting unit 181 for performing the setting whether or not to include the ink-dyed banknote into calculation of a deposit amount, the ink-dyed banknote being found true as the identification result and having a specific damage, and the calculation unit 182 for calculating the deposit amount of the deposited banknote based on the identification result by the identification unit 16 and the setting by the setting unit 181.

[0093] With such a configuration, when the ink-dyed banknote whose handling is not fixed is deposited, it is possible to appropriately change whether or not to include it in the deposit amount and cope with it flexibly.

[0094] In addition, the banknote processing apparatus 1 according to the embodiment of the present disclosure stores the ink-dyed banknote together with the suspect note which authentication cannot be determined and which is suspected as the counterfeit note.

[0095] With such a configuration, since it is not necessary to provide a storage unit for storing the ink-dyed banknote separately, it is possible to downsize the storage box 20 and downsize the banknote processing apparatus 1. In addition, it is possible to provide the banknote processing apparatus 1 capable of coping with the ink-dyed banknote without increasing the cost.

[0096] The banknote processing apparatus 1 according to the embodiment of the present disclosure further comprises the temporary reserve unit 17 for reserving the banknote temporarily, and the conveyance unit 15 conveys the ink-dyed banknote from the second storage unit 23 to the discharge unit 13 and conveys the banknote other than the ink-dyed banknote from the second storage unit 23 to the temporary reserve unit 17 when an instruction to discharge the ink-dyed banknote is received.

[0097] With such a configuration, even when the ink-dyed banknote and the other banknote are stored in the same storage unit, only the ink-dyed banknote can be distinguished and discharged. Therefore, when the administrator needs to check the ink-dyed banknote visually, the administrator can quickly acquire only the ink-dyed banknote from the banknote processing apparatus 1 quickly and easily.

[0098] The ink-dyed banknote and the suspect note are stored in the second storage unit 23 capable of feeding out. Therefore, it is possible to discharge the ink-dyed banknote easily without opening the storage box 20 which is a safe.

[0099] The present disclosure is useful in the banknote processing apparatus which receives the deposit processing or the discharge processing.

Claims

1. A banknote processing apparatus, comprising:

an identification unit for identifying authentication and fitness of a deposited banknote;

- a setting unit for performing a setting whether or not to include a specific damaged banknote into calculation of a deposit amount, the specific damaged banknote being found true as the identification result and having a specific damage; and
 a calculation unit for calculating the deposit amount of the deposited banknote based on the identification result by the identification unit and the setting.
2. The banknote processing apparatus according to claim 1, further comprising:
- a storage unit for storing the deposited banknote; and
 a control unit for controlling the storage unit to store the specific damaged banknote together with another damaged banknote when the setting unit has made setting to include the specific damaged banknote by the setting unit, and to store the specific damaged banknote separately from another banknote when it is not set to include the specific damaged banknote.
3. The banknote processing apparatus according to claim 2, wherein the control unit controls the storage unit to store the specific damaged banknote together with a banknote suspected of being a counterfeit note when it is not set to include by the setting unit.
4. The banknote processing apparatus according to any one of claims 1 to 3, wherein the specific damaged banknote is an ink-dyed banknote to which a special ink is adhered.
5. The banknote processing apparatus according to claim 1, further comprising an operation unit for receiving an operation for defining the setting.
6. The banknote processing apparatus of claim 1, further comprising a memory unit for memorizing the setting that has been previously determined.
7. The banknote processing apparatus according to claim 2 or 3, further comprising:
- a discharge unit for discharging the banknote;
 an instruction receiving unit for receiving an instruction for discharging the specific damaged banknote; and
 a conveyance unit for conveying only the specific damaged banknote to the discharge unit when the instruction is received.
8. The banknote processing apparatus according to claim 7, further comprising a temporary reserve unit for temporarily reserving a banknote, wherein
- the conveyance unit conveys the specific damaged banknote from the storage unit to the discharge unit when the instruction is received, and conveys a banknote other than the specific damaged banknote from the storage unit to the temporary reserve unit.
9. The banknote processing apparatus according to claim 8, wherein the conveyance unit conveys the banknote other than the specific damaged banknote reserved in the temporary reserve unit to the storage unit after the discharge of the specific damaged banknote is completed.
10. A banknote processing apparatus, comprising:
- an identification unit for identifying whether or not a deposited banknote has a predetermined feature;
 a storage unit for storing the banknote identified by the identification unit regardless of the presence or absence of the feature; and
 a calculation unit for calculating the deposit amount of the deposited banknote based on a setting of whether or not to include a banknote having the predetermined feature among the banknotes stored in the storage unit into calculation of the deposit amount of the deposited banknote.
11. The banknote processing apparatus according to claim 10, wherein the banknote having the predetermined feature is an ink-dyed banknote to which a special ink is adhered.

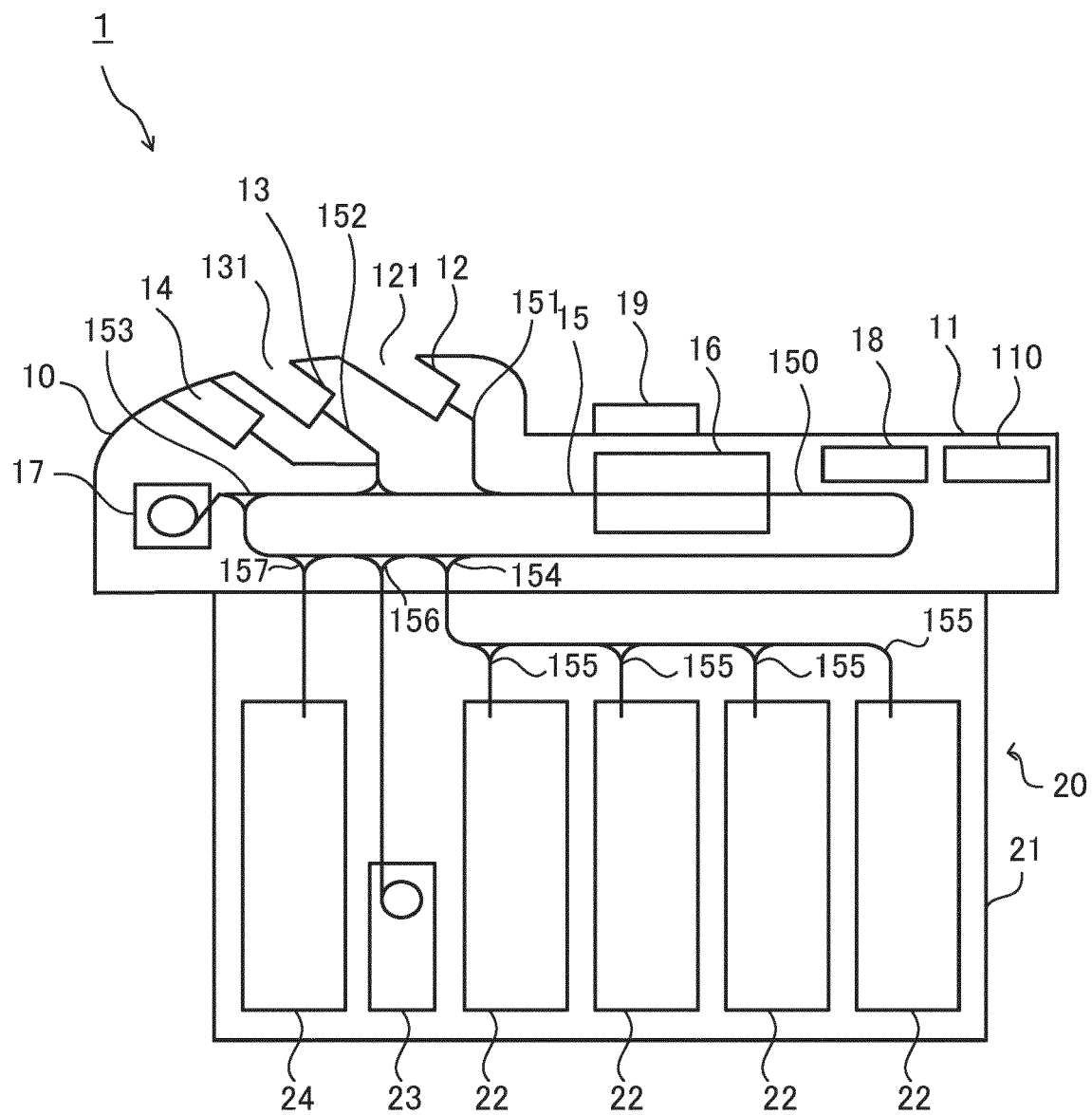


FIG. 1

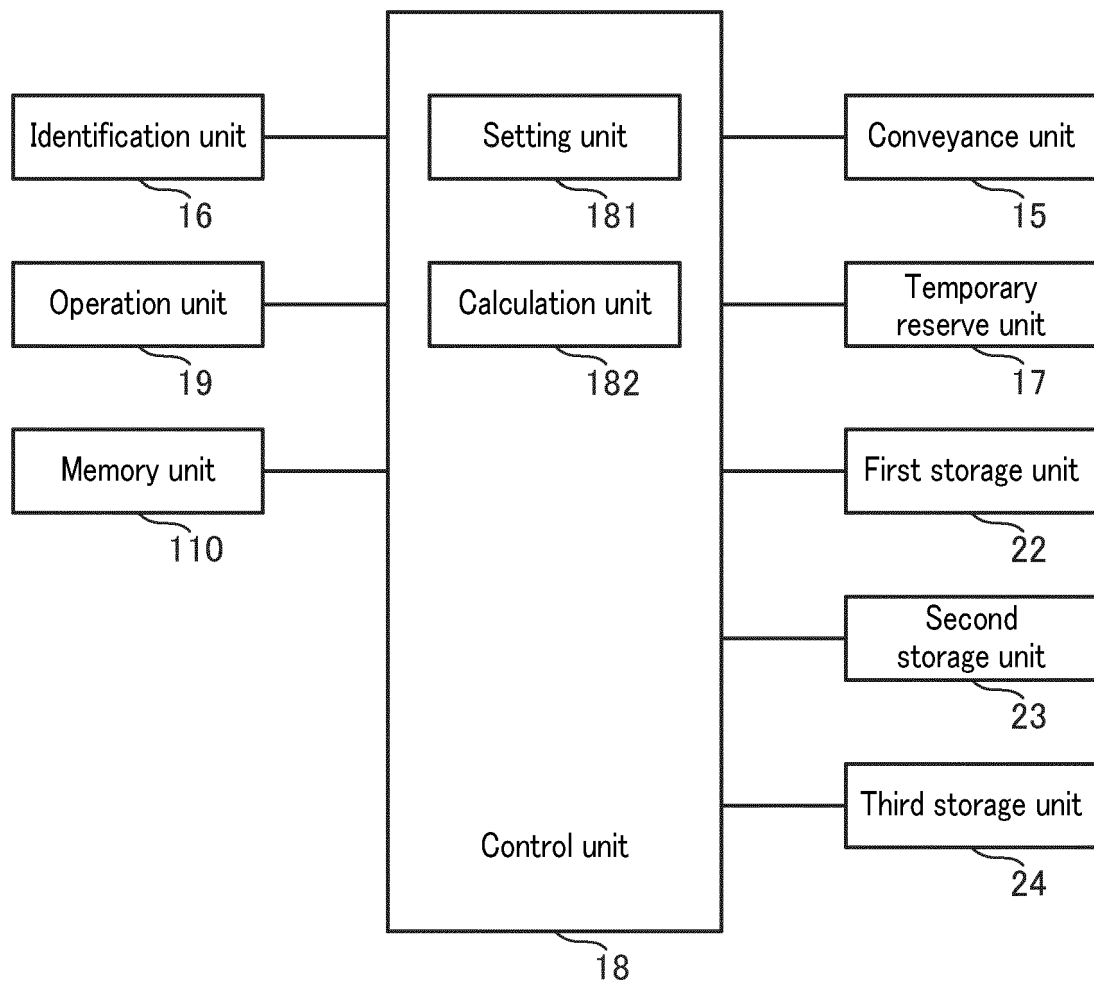


FIG. 2

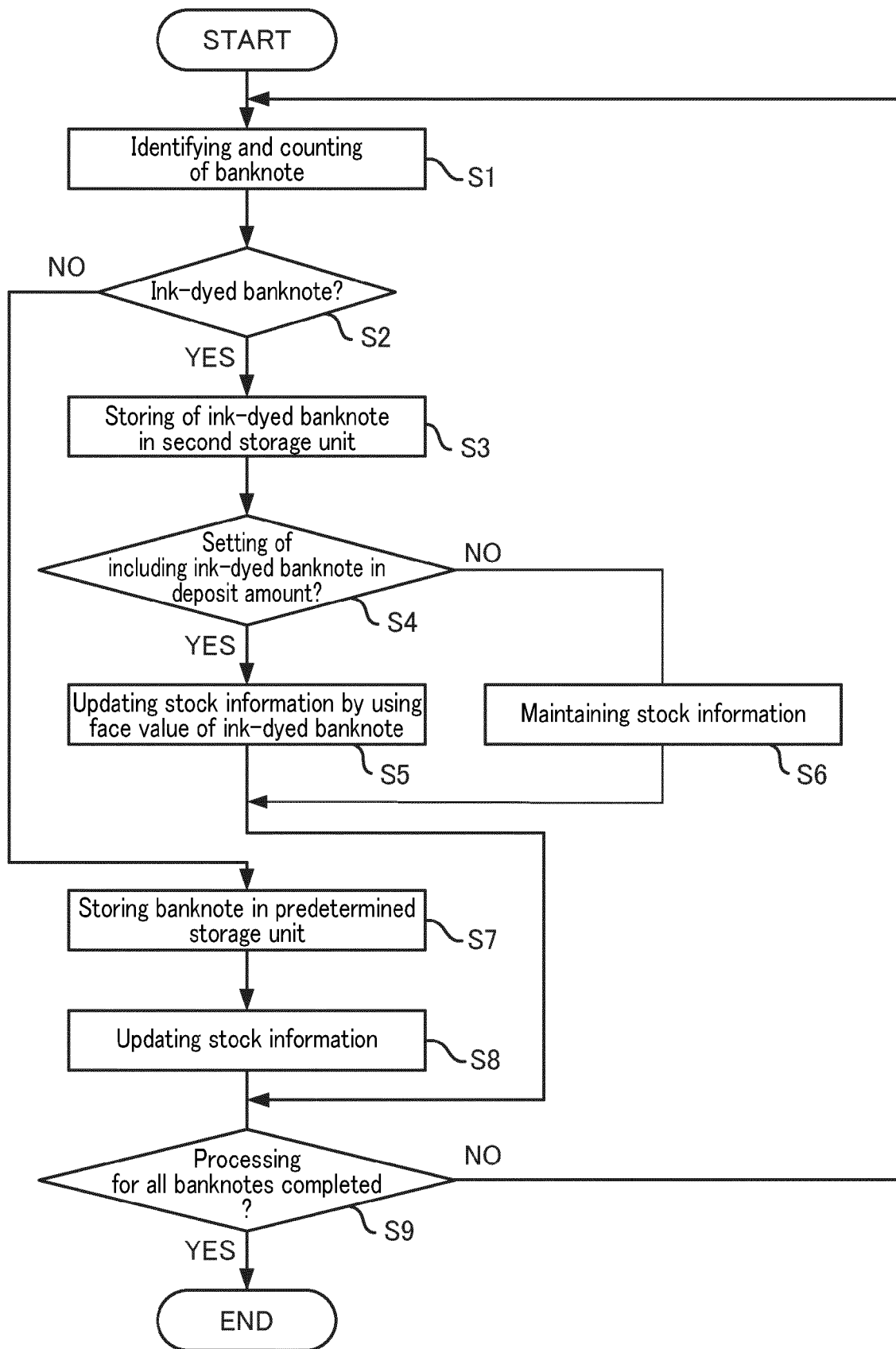


FIG. 3

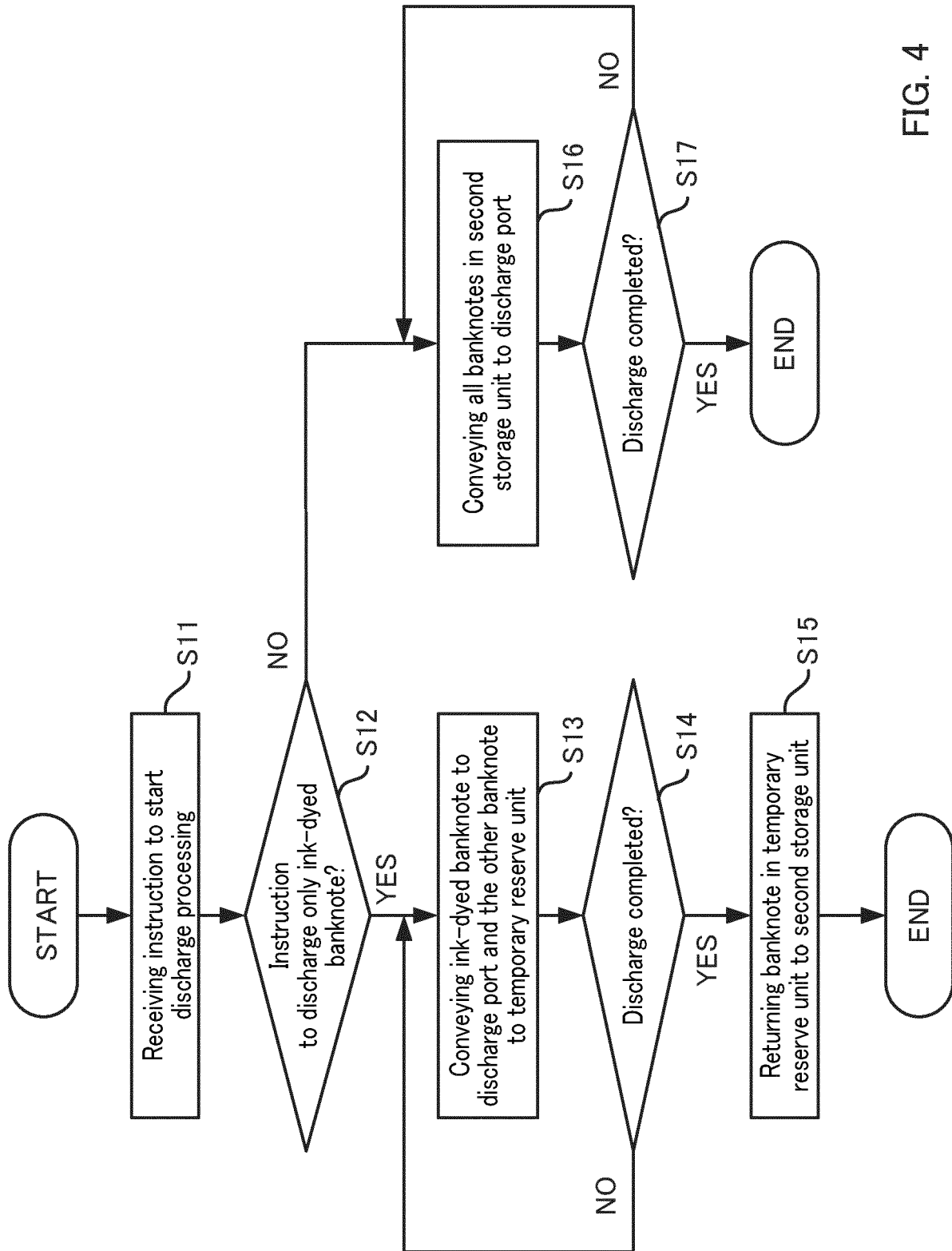


FIG. 4



EUROPEAN SEARCH REPORT

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Place of search The Hague		Date of completion of the search 30 July 2021	Examiner Schikhof, Arnout
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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