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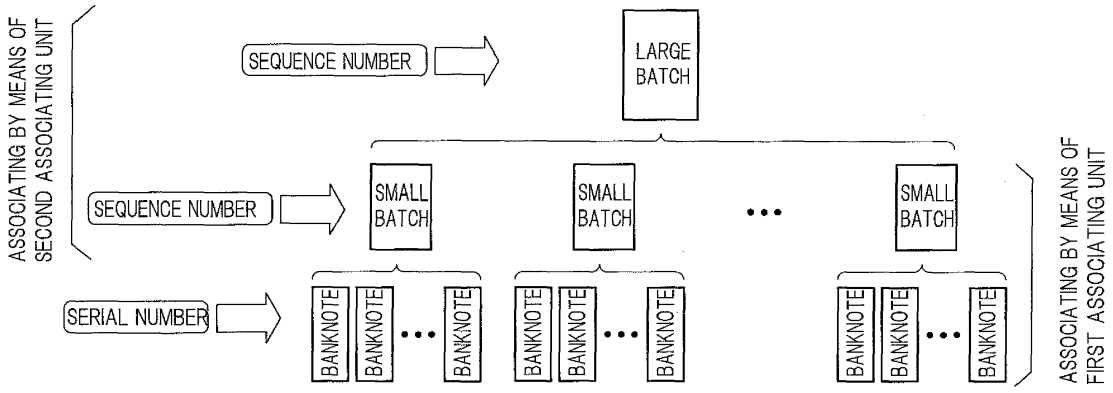
(54) **LARGE-BUNDLE CREATION SYSTEM AND LARGE-BUNDLE CREATION METHOD**

(57) The large-batch making system 10 includes: a first associating unit 26 configured to associate management information on each small batch with a serial number of each banknote constituting the small batch; a second associating unit 34 configured to associate management information on the large batch with the management information on each small batch constituting the large batch, and a managing unit 42 configured to manage the associated information by the first associating unit 26 and the associated information by the second associating unit 34 in correlation with each other.



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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a large-batch making system and a large-batch making method for making a large batch that consists of a plurality of stacked small batches of banknotes, each of the stacked small batches being bundled.

BACKGROUND ART

[0002] There has been conventionally known a banknote bundling apparatus and a banknote bundling method for making a large batch: by making a small batch by bundling a plurality of (e.g., one hundred) banknotes with a first bundling paper, and by making the large batch by bundling, e.g., ten small batches, which are stacked on one another like layers, with a second bundling paper. A small-batch making machine for making a small batch formed by bundling a plurality of (e.g., one hundred) banknotes with a bundling paper is disclosed in WO 2010 / 103620 or WO 2011 / 039833. JP 64-41094 A discloses a paper-sheet handling apparatus that cuts the bundling paper of the large batch to separate the individual small batches and further cuts the bundling paper of each small batch to separate the individual paper sheets. According to the paper-sheet handling apparatus disclosed in JP 64-41094 A, after the bundling paper of the large batch and the bundling paper of each small batch are cut, a management number of each bundling paper that has been already read electrically and a recognition result of each paper sheet are compared to each other, so that it can be inspected where an abnormal banknote or the like comes from if the latter is incorporated in the paper sheets.

SUMMARY OF THE INVENTION

[0003] However, according to the paper-sheet handling apparatus disclosed in JP 64-41094 A, the bundling paper of the large batch and the bundling paper of each small batch have to be cut. This needs some extra time. In addition, the cut bundling papers become waste materials.

[0004] The present invention has been made in view of the above circumstances. The object of the present invention is to provide a large-batch making system and a large-batch making method that can rapidly and easily trace a specific banknote without cutting any bundling paper of the large batch and the small batches: by associating management information on each small batch with a serial number of each banknote constituting the small batch, by associating management information on the large batch with the management information on each small batch constituting the large batch, and by managing these associated information in correlation with each other.

[0005] The present invention is a large-batch making system for making a large batch that consists of a plurality of stacked small batches of banknotes, each of the stacked small batches being bundled, the large-batch making system including: a first associating unit configured to associate management information on each small batch with a serial number of each banknote constituting the small batch; a second associating unit configured to associate management information on the large batch with the management information on each small batch constituting the large batch; and a managing unit configured to manage the associated information by the first associating unit and the associated information by the second associating unit in correlation with each other.

[0006] According to such a large-batch making system, by means of the first associating unit, the management information on each small batch and the serial number of each banknote constituting the small batch are associated with each other, and by means of the second associating unit, the management information on the large batch and the management information on each small batch constituting the large batch are associated with each other. Subsequently, by means of the managing unit, the associated information by the first associating unit and the associated information by the second associating unit are managed in correlation with each other. Accordingly, the management information on each small batch and the serial number of each banknote constituting the small batch are associated with each other, the management information on the large batch and the management information on each small batch constituting the large batch are associated with each other, and the both associated information are managed in correlation with each other. Thereby, a specific banknote can be traced rapidly and easily without cutting any bundling member (e.g., bundling paper) of the large batch or the small batches.

[0007] The large-batch making system of the present invention may further include a management-information searching unit configured to search and output management information on a small batch or management information on a large batch that includes a specific banknote of an inputted serial number, based on the inputted serial number.

[0008] The large-batch making system of the present invention may further include a small-batch making machine for making a small batch formed by bundling a plurality of banknotes, wherein the first associating unit may be provided in the small-batch making machine.

[0009] In this case, the large-batch making system may further include a controlling unit, wherein the managing unit may be provided in the controlling unit, and the associated information by the first associating unit may be configured to be sent from the small-batch making machine to the controlling unit.

[0010] In the large-batch making system according to the present invention, the second associating unit may include a seal-member attaching unit, a printing unit or

an IC-tag attaching unit, utilized for a wrapping sheet of the large batch or a bundling paper of the large batch.

[0011] The large-batch making system according to the present invention may further include a large-batch-location searching unit configured to search and output information about location of a large batch, based on the inputted serial number, the management information on a small batch or the management information on the large batch, by managing associated information formed by associating the information about location of the large batch with the management information on the large batch.

[0012] The present invention is a large-batch making method for making a large batch that consists of a plurality of stacked small batches of banknotes, each of the stacked small batches being bundled, the large-batch making method including: a first associating step of associating management information on each small batch with a serial number of each banknote constituting the small batch; a second associating step of associating management information on the large batch with the management information on each small batch constituting the large batch; and a managing step of managing the associated information by the first associating unit and the associated information by the second associating unit in correlation with each other.

[0013] According to such a large-batch making method, at the first associating step, the management information on each small batch and the serial number of each banknote constituting the small batch are associated with each other, and at the second associating step, the management information on the large batch and the management information on each small batch constituting the large batch are associated with each other. Subsequently, at the managing step, the associated information at the first associating step and the associated information at the second associating step are managed in correlation with each other. Accordingly, the management information on each small batch and the serial number of each banknote constituting the small batch are associated with each other, the management information on the large batch and the management information on each small batch constituting the large batch are associated with each other, and the both associated information are managed in correlation with each other. Thereby, a specific banknote can be traced rapidly and easily without cutting any bundling member (e.g., bundling paper) of the large batch or the small batches.

[0014] The large-batch making method of the present invention may further include a step of searching and outputting management information on a small batch or management information on a large batch that includes a specific banknote of an inputted serial number, based on the inputted serial number.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Fig. 1 is a schematic structural view showing a schematic structure of a large-batch making system in one embodiment of the present invention;
Fig. 2 is a perspective view showing an appearance of a small batch, which is made by the small-batch making machine in the large-batch making system shown in Fig. 1;
Fig. 3 is a perspective view showing an appearance of a large batch wrapped with a wrapping sheet, which is made by the large-batch making machine in the large-batch making system shown in Fig. 1;
Fig. 4 is a schematic view showing a relationship between the large batch, the small batches and the banknotes, which are associated with each other by means of the first associating unit and the second associating unit;
Fig. 5 is a screen for searching management information, which is displayed on a display part of a controlling unit in the large-batch making system shown in Fig. 1;
Fig. 6 is a screen for displaying an output when a serial number of a banknote is inputted, which corresponds to the screen for searching management information shown in Fig. 5; and
Fig. 7 is a perspective view showing an example of palette on which a plurality of large batches are placed, each large batch being made by the large-batch making machine in the large-batch making system shown in Fig. 1.

MODE FOR CARRYING OUT THE INVENTION

[0016] An embodiment of the present invention will be described herebelow with reference to the drawings. Figs. 1 to 7 are views showing a structure of a large-batch making system according to this embodiment. Fig. 1 is a schematic structural view showing a schematic structure of a large-batch making system in this embodiment, Fig. 2 is a perspective view showing an appearance of a small batch, which is made by the small-batch making machine in the large-batch making system shown in Fig. 1, and Fig. 3 is a perspective view showing an appearance of a large batch wrapped with a wrapping sheet, which is made by the large-batch making machine in the large-batch making system shown in Fig. 1. In addition, Fig. 4 is a schematic view showing a relationship between the large batch, the small batches and the banknotes, which are associated with each other by means of the first associating unit and the second associating unit. Furthermore, Fig. 5 is a screen for searching management information, which is displayed on a display part of a controlling unit in the large-batch making system shown in Fig. 1, and Fig. 6 is a screen for displaying an output when a serial number of a banknote is inputted, which corresponds to the screen for searching management information shown in Fig. 5. In addition, Fig. 7 is a perspective view showing an example of palette on which a plurality of large batches are placed, each large batch

being made by the large-batch making machine in the large-batch making system shown in Fig. 1.

[0017] As shown in Fig. 1, the large-batch making system in this embodiment 10 includes a small-batch making machine 20, a large-batch making machine 30 and a controlling unit 40.

[0018] For example, the small-batch making machine 20 is a banknote handling machine that performs various processes such as a banknote depositing process, a banknote dispensing process and so on. The small-batch making machine 20 is configured to feed therein set banknotes one by one, recognize each of them, stack the predetermined number of recognized banknotes, and bundle them. The small-batch making machine 20 has a serial-number reading-out unit 22 that reads out the serial number of a banknote located in the small-batch making machine 20, and a small-batch making unit 24 that makes a small batch B by stacking a plurality of (e.g., one hundred) banknotes whose serial numbers have been read out by the serial-number reading-out unit 22 and bundling them with a bundling paper P. Fig. 2 shows a small batch B made by the small-batch making unit 24. The small batch B shown in Fig. 2 consists of a plurality of (e.g., one hundred) banknotes bundled with a bundling paper P. The small batch B made by the small-batch making machine 20 is transported to a large-batch making machine 30.

[0019] In addition, the small-batch making machine 20 is provided with a first associating unit 26 that is configured to associate management information on each small batch B with a serial number of each banknote constituting the small batch B. Specifically, in the small-batch making unit 24, a sequence number is printed on the bundling paper P bundling the small batch B by means of a printer or the like, and the sequence number printed on the bundling paper P is used as the management information on each small batch B. The associated information by the first associating unit 26 is transported from the small-batch making machine 20 to a controlling unit 40, which is described below.

[0020] The large-batch making machine 30 is provided separately from the small-batch making machine 20. The large-batch making machine 30 has a large-batch making unit 32 that makes a large batch A by stacking a plurality of (e.g., ten) small batches B made by the small-batch making machine 20. In more detail, the large-batch making unit 32 stacks ten small batches B made by the small-batch making machine 20 and bundles them with another bundling paper (not shown) different from the bundling paper P to make a large batch A. Alternatively, the large-batch making unit 32 stacks ten small batches B made by the small-batch making machine 20 and wraps them with a wrapping sheet S to make a large batch A. For example, a transparent or translucent resin film is used as the wrapping sheet S. Fig. 3 shows an appearance of a large batch A that consists of ten small batches B made by the small-batch making machine 20, stacked on one another like layers and wrapped with a wrapping sheet S. In addition, as shown in Fig. 1, the large-batch making machine 30 has a small-batch management-information obtaining unit 36. The small-batch management-information obtaining unit 36 is configured to take the sequence number printed on the bundling paper P of each of the stacked small batches B by means of a camera or the like. Alternatively, the small-batch management-information obtaining unit 36 is configured to obtain the sequence number as data from the small-batch making machine 20 or the controlling unit 40.

[0021] In addition, the large-batch making machine 30 is provided with a second associating unit 34 that is configured to associate management information on the large batch A with the management information on each small batch B constituting the large batch A. Specifically, in the large-batch making machine 30, any one of an attaching step of a seal member on which a sequence number has been printed, a printing step of a sequence number and an attaching step of an IC-tag in which information on a sequence number has been written, is conducted to the wrapping sheet S wrapping the large batch A or the bundling paper (not shown) bundling the large batch A. The sequence number in these measures is used as the management information on the large batch A. The sequence number may be printed on the seal member or the like, or a barcode corresponding to the sequence number may be printed on the seal member, when the seal member on which the sequence number has been printed is attached to the wrapping sheet S wrapping the large batch A or the bundling paper bundling the large batch A, or when the sequence number is printed on the wrapping sheet S wrapping the large batch A or the bundling paper bundling the large batch A. As described above, the sequence number printed on the bundling paper P bundling the small batch B is used as the management information on the small batch B. The associated information by the second associating unit 34 is transported from the large-batch making machine 30 to the controlling unit 40, which is described below.

[0022] Fig. 4 is an explanatory view for explaining the associating step by the first associating unit 26 of the small-batch making machine 20 and the associating step by the second associating unit 34 of the large-batch making machine 30. As described above, by means of the first associating unit 26 of the small-batch making machine 20, the sequence number being the management information on the small batch B and the serial number of each banknote constituting the small batch B are associate with each other. In addition, by means of the second associating unit 34 of the large-batch making machine 30, the sequence number being the management information on the large batch A and the sequence number being the management information on each small batch B constituting the large batch A are associate with each other.

[0023] The controlling unit 40 is provided separately from the small-batch making machine 20 and the large-

batch making machine 30. For example, a management computer is used as the controlling unit 40. Such a controlling unit 40 has a management unit (storage unit) 42, a management-information searching unit 44 and a large-batch-location searching unit 46. The management unit 42 is configured to manage by associating both of the associated information by the first associating unit 26 and the associated information by the second associating unit 34. That is, as shown in Fig. 4, since both of the associated information by the first associating unit 26 and the associated information by the second associating unit 34 are associated with each other, the sequence number of the large batch A, the sequence number of each small batch B constituting the large batch A, and the serial number of each banknote constituting each small batch B are integrally associated with one another.

[0024] In addition, the management-information searching unit 44 is configured to search and output the management information on a small batch B or the management information on a large batch A, which includes a specific banknote of an inputted serial number, based on the inputted serial number. As described above, when a management computer is used as the controlling unit 40, such a controlling unit 40 is provided with a display part 48, which consists of a monitor, for example, and an input part 50, which consists of a keyboard and/or a mouse, for example. When the management information on a small batch B or the management information on a large batch A is searched by the management-information searching unit 44, a screen for searching management information as shown in Fig. 5 is displayed on the display unit 48 of the controlling unit 40. When an operator would like to trace a specific banknote, the operator inputs the serial number of the specific banknote at the input part 50 with reference to the screen for searching management information as shown in Fig. 5. As a result, the sequence number of a small batch B and the sequence number of a large batch A corresponding to the specific banknote (including the specific banknote) are displayed on the display unit 48. In Fig. 6, both of the sequence number of a large batch A and the sequence number of a small batch B corresponding to the specific banknote of the serial number inputted at the input part 50 are displayed on the display part 48. However, at least one of the sequence number of a large batch A and the sequence number of a small batch B may be displayed. In this manner, the management-information searching unit 44 searches and outputs the management information on a small batch B or the management information on a large batch A, which includes a specific banknote of an inputted serial number, based on the inputted serial number at the input part 50. The outputted information is displayed on the display part 48.

[0025] Herein, various information other than the sequence number of a large batch A and the sequence number of a small batch B may be displayed on the display part 48 when the operator inputs a serial number of a banknote at the input part 50. For example, on the display part 40 may be displayed a date and/or time when the small batch B was made by the small-batch making machine 20, a date and/or time when the large batch A was made by the large-batch making machine 30, an apparatus number of the small-batch making machine 20, an apparatus number of the large-batch making machine 30, denomination of the banknote, a transaction number, an ID number of the operator, a customer code, and so on.

[0026] In addition, when an operator inputs a serial number of a banknote at the input part 50, information about location of a large batch B including the banknote may be searched and displayed on the display part 48. Herein, in order to manage the large batches A made by the large-batch making machine 30, the large batches A may be stored on the palettes C or the like in a vault or a storehouse (see Fig. 7). Alternatively, the large batches A may be stored in containers (not shown). In these cases, a palette number or a container number, or information on a place to which the palette C or the container should be delivered, may be displayed on the display part 48 as the information about location of a large batch A. In this manner, the large-batch-location searching unit 46 of the controlling unit 40 is configured to search and output the information about location of a large batch A (specifically, the palette number or the container number, or information on a place to which the palette C or the container should be delivered), based on the serial number of a banknote inputted at the input part 50, by managing the associated information formed by associating the information about location of the large batch A with the management information on the large batch A. Subsequently, for example, the operator uses a hand scanner for reading out the barcode printed on the seal member or the like attached on the wrapping sheet S of the large batch A. The operator may be informed that the scanned large batch A is the objective large batch A by an alarming buzzer which is activated when the objective large batch A is read out.

[0027] Herein, the large-batch-location searching unit 46 may be configured to search and output the information about location of a large batch A, for example when the management information on a small batch B or the management information on a large batch A is inputted, except when a serial number of a banknote is inputted at the input part 50. In addition, when the operator inputs a serial number of a banknote at the input part 50, a management condition of the large batch A including the banknote may be displayed on the display part 48. Herein, the management condition of the large batch A means a storage condition or a shipping condition of the large batch A made by the large-batch making machine 30, such as "the palette C on which the large batch A is placed will be shipped soon" or "the large batch A was shipped on a certain date".

[0028] In addition, when the operator inputs a plurality of serial numbers of a plurality of banknotes at the input part 50 (for example, when the operator designates a

range of serial number), the sequence number of a small batch B or a large batch A which includes the extracted banknotes may be displayed on the display part 48.

[0029] As described above, according to the large-batch making system 10 and the large-batch making method of the present embodiment, by means of the first associating unit 26, the management information on each small batch B and the serial number of each banknote constituting the small batch B are associated with each other, and by means of the second associating unit 34, the management information on the large batch A and the management information on each small batch B constituting the large batch A are associated with each other. Subsequently, by means of the managing unit 42, the associated information by the first associating unit 26 and the associated information by the second associating unit 34 are managed in correlation with each other. Accordingly, the management information on each small batch B and the serial number of each banknote constituting the small batch B are associated with each other, the management information on the large batch A and the management information on each small batch B constituting the large batch A are associated with each other, and the both associated information are managed in correlation with each other. Thereby, a specific banknote can be traced rapidly and easily without cutting a bundling paper for bundling the large batch A and the bundling papers P for bundling the small batches B.

[0030] In addition, according to the large-batch making system 10 of the present embodiment, the management-information searching unit 44 is configured to search and output the management information on a small batch B or the management information on a large batch A that includes a specific banknote of an inputted serial number, based on the inputted serial number. Thus, the operator can recognize the management information on a small batch B or the management information on a large batch A that includes a specific banknote of the inputted serial number, only by inputting the serial number. Therefore, the operator can trace the small batch B or the large batch A that includes the specific banknote rapidly and easily.

[0031] In addition, according to the large-batch making system 10 of the present embodiment, the first associating unit 26 is provided in the small-batch making machine 20. In addition, the managing unit 42 is provided in the controlling unit 40, and the associated information by the first associating unit 26 is configured to be sent from the small-batch making machine 20 to the controlling unit 40.

[0032] In addition, according to the large-batch making system 10 of the present embodiment, the second associating unit 34 includes any one of a seal-member attaching unit, a printing unit and an IC-tag attaching unit, for the wrapping sheet S of the large batch A or the bundling paper (not shown) of the large batch A.

[0033] In addition, according to the large-batch making system 10 of the present embodiment, the large-batch-location searching unit 46 is configured to search and output the information about location of a large batch A, based on the inputted serial number, the management information on the small batch B or the management information on the large batch A, by managing the associated information formed by associating the information about location of the large batch A with the management information on the large batch A. Thus, the operator can recognize the information about location of the large batch A, only by inputting the management information on the small batch B or the management information on the large batch A. Therefore, the operator can trace the large batch A that includes the specific banknote rapidly and easily.

[0034] The large-batch making system and the large-batch making method of the present invention are not limited to the above embodiment, but various modifications are applicable thereto.

[0035] For example, in the controlling unit 40, when the operator inputs the management information on the small batch B or the management information on the large batch A at the input part 50, the serial numbers of the banknotes included in the small batch B or the large batch A may be searched and outputted as a list table. In this case, the outputted serial numbers of the banknotes may be displayed on the display part 48.

[0036] In addition, when a small batch B is made by the small-batch making machine 20, the serial numbers of the banknotes constituting the small batch B are read out by the serial-number reading-out unit 22. If there are a plurality of banknotes having the same serial number in one or more large batches A made by the large-batch making machine 30, the controlling unit 40 is configured to output warning information to inform that the large batches A may include a counterfeit banknote. The outputted warning information may be displayed on the display part 48.

[0037] In addition, the information searched and outputted by the management-information searching unit 44 and/or the large-batch-location searching unit 46 of the controlling unit 40 may not be displayed on the display part 48. The information outputted by the management-information searching unit 44 and/or the large-batch-location searching unit 46 may be sent to another device such as a higher-level device that is provided outside the controlling unit 40. The information outputted by the management-information searching unit 44 and/or the large-batch-location searching unit 46 may be printed on a paper if a printing unit such as a printer is provided in the controlling unit 40.

[0038] In addition, in the large-batch making system of the present invention, the small-batch making machine 20 is not limited to the banknote handling machine that performs various processes such as a banknote depositing process, a banknote dispensing process and so on. A mere apparatus configured to make a small batch B by stacking a plurality of (e.g., one hundred) banknotes and by bundling the banknotes by a bundling paper P, may be used as the small-batch making machine 20.

Claims

1. A large-batch making system for making a large batch that consists of a plurality of stacked small batches of banknotes, each of the stacked small batches being bundled, the large-batch making system comprising:

   a first associating unit configured to associate management information on each small batch with a serial number of each banknote constituting the small batch;
   a second associating unit configured to associate management information on the large batch with the management information on each small batch constituting the large batch; and
   a managing unit configured to manage the associated information by the first associating unit and the associated information by the second associating unit in correlation with each other.

2. The large-batch making system according to claim 1, further comprising,
   a management-information searching unit configured to search and output management information on a small batch or management information on a large batch that includes a specific banknote of an inputted serial number, based on the inputted serial number.

3. The large-batch making system according to claim 1 or 2, further comprising
   a small-batch making machine for making a small batch formed by bundling a plurality of banknotes,
   wherein the first associating unit is provided in the small-batch making machine.

4. The large-batch making system according to claim 3, further comprising a controlling unit,
   wherein the managing unit is provided in the controlling unit, and
   the associated information by the first associating unit is configured to be sent from the small-batch making machine to the controlling unit.

5. The large-batch making system according to any one of claims 1 to 4,
   wherein the second associating unit includes a seal-member attaching unit, a printing unit or an IC-tag attaching unit, utilized for a wrapping sheet of the large batch or a bundling paper of the large batch.

6. The large-batch making system according to any one of claims 1 to 5, further comprising
   a large-batch-location searching unit configured to search and output information about location of a large batch, based on the inputted serial number, the management information on a small batch or the management information on the large batch, by managing associated information formed by associating the information about location of the large batch with the management information on the large batch.

7. A large-batch making method for making a large batch that consists of a plurality of stacked small batches of banknotes, each of the stacked small batches being bundled, the large-batch making method comprising:

   associating management information on each small batch with a serial number of each banknote constituting the small batch;
   associating management information on the large batch with the management information on each small batch constituting the large batch; and
   managing the respective information associated at the respective associating in correlation with each other.

8. The large-batch making method according to claim 7, further comprising,
   searching and outputting management information on a small batch or management information on a large batch that includes a specific banknote of an inputted serial number, based on the inputted serial number.

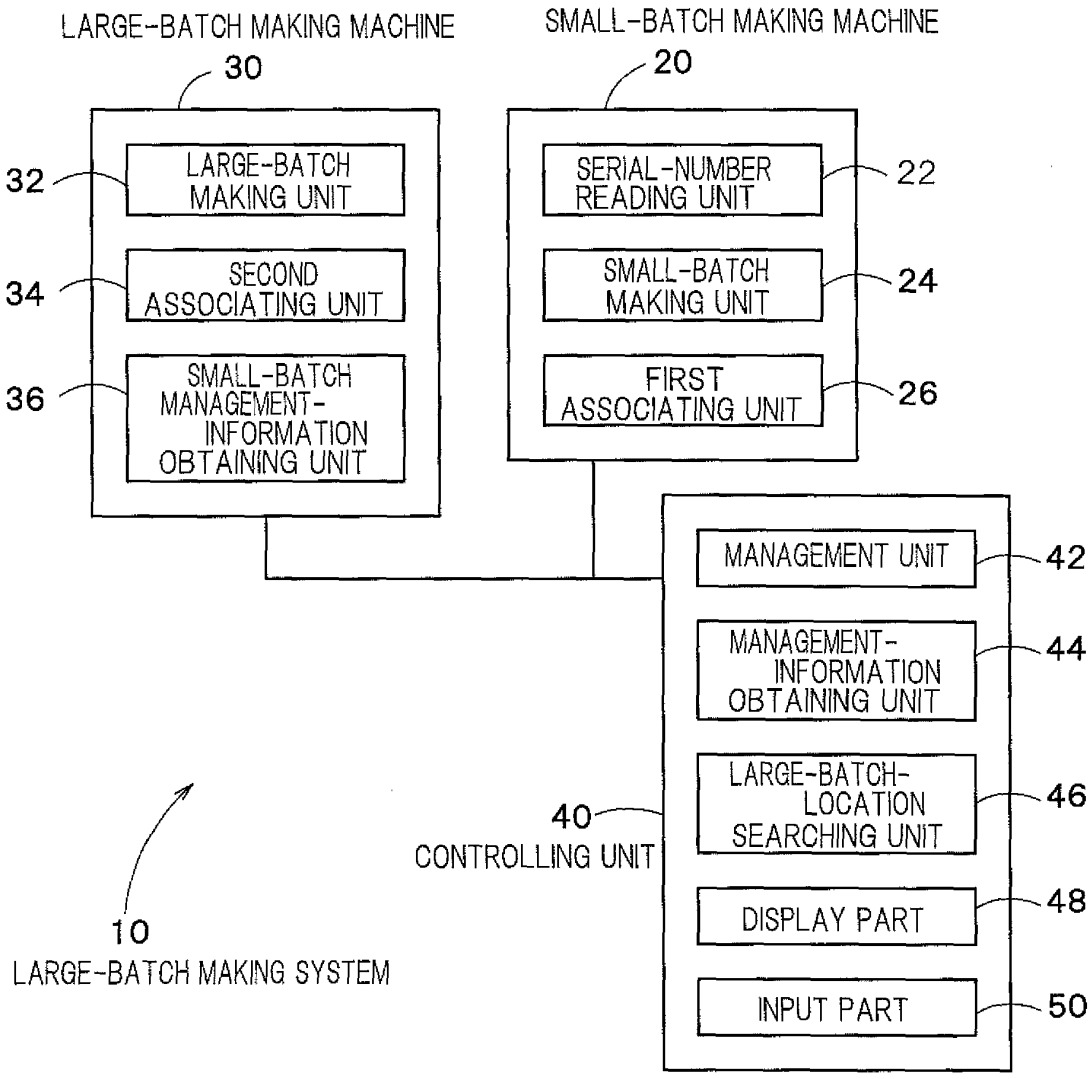

LARGE-BATCH MAKING MACHINE
30
32
LARGE-BATCH MAKING UNIT
34
SECOND ASSOCIATING UNIT
36
SMALL-BATCH MANAGEMENT-INFORMATION OBTAINING UNIT
SMALL-BATCH MAKING MACHINE
20
SERIAL-NUMBER READING UNIT
22
SMALL-BATCH MAKING UNIT
24
FIRST ASSOCIATING UNIT
26
MANAGEMENT UNIT
42
MANAGEMENT-INFORMATION OBTAINING UNIT
44
LARGE-BATCH-LOCATION SEARCHING UNIT
46
40
CONTROLLING UNIT
DISPLAY PART
48
INPUT PART
50
10
LARGE-BATCH MAKING SYSTEM

FIG. 1

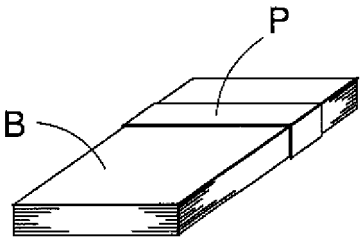


FIG. 2

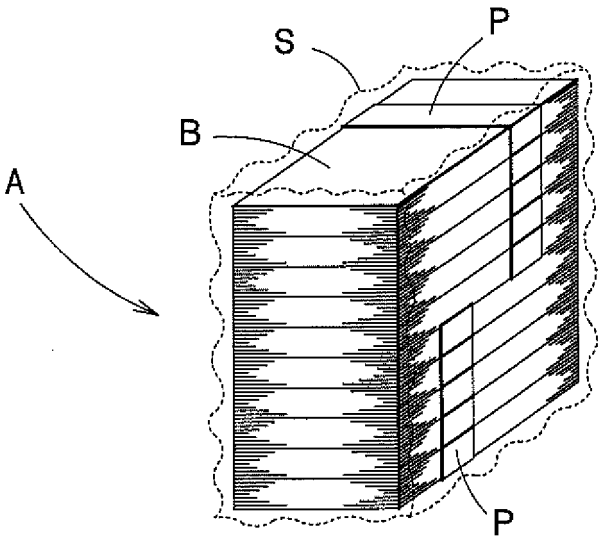
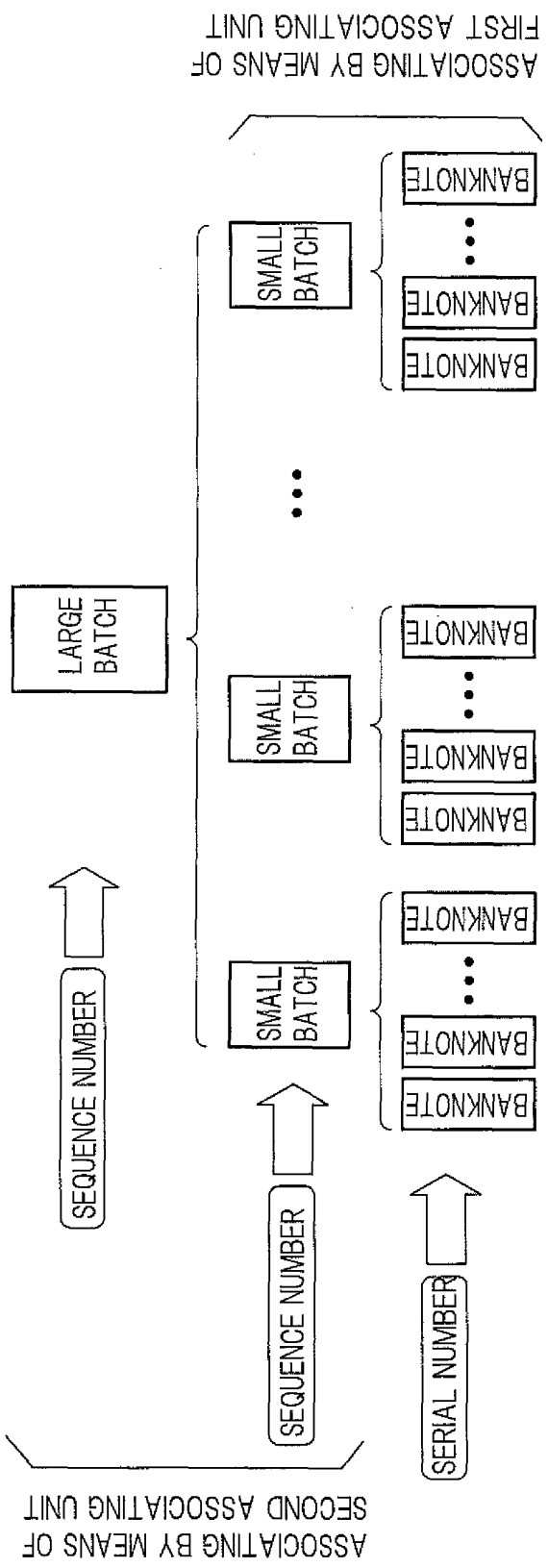


FIG. 3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SMALL BATCH
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BANKNOTE
BANKNOTE
BANKNOTE
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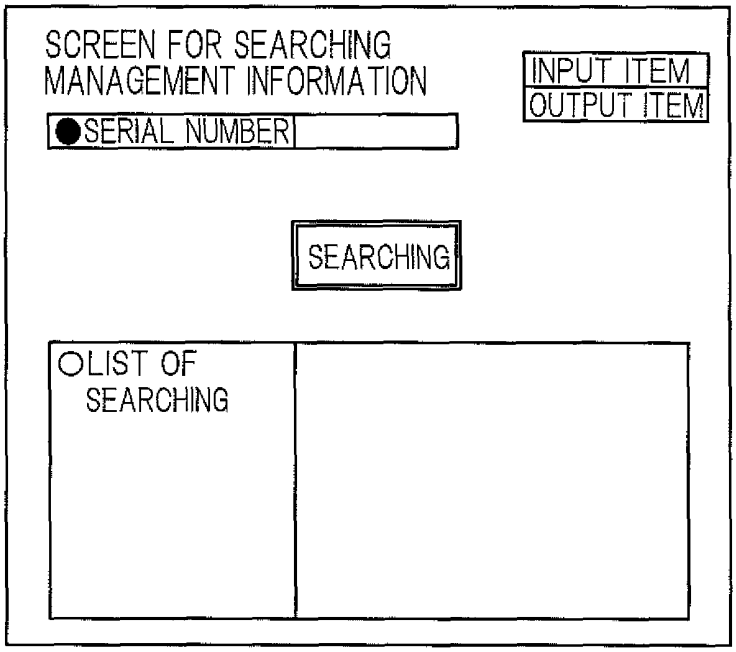
BANKNOTE
SEQUENCE NUMBER
SEQUENCE NUMBER
SERIAL NUMBER
ASSOCIATING BY MEANS OF SECOND ASSOCIATING UNIT

FIG. 4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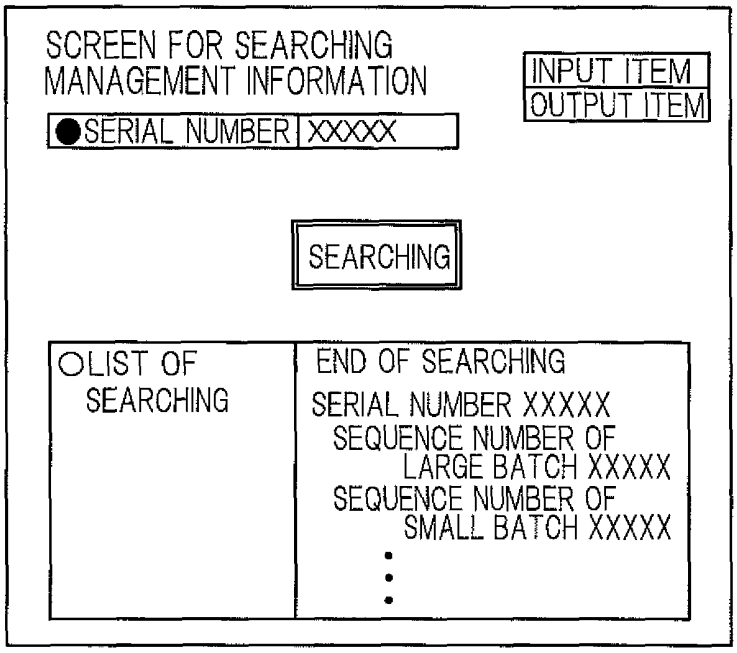
SEARCHING
○LIST OF
SEARCHING

FIG. 5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OUTPUT ITEM
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SEARCHING
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SEARCHING
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SEQUENCE NUMBER OF
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SMALL BATCH XXXXX

FIG. 6

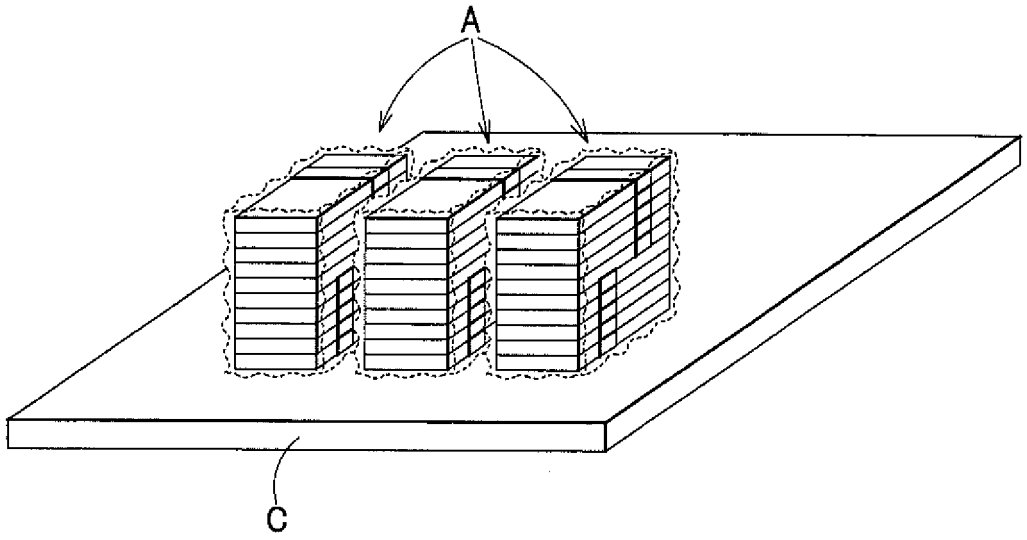

FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2012/064827

A. CLASSIFICATION OF SUBJECT MATTER
G07D9/00(2006.01)i, *B65B27/08*(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G07D9/00, B65B27/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2012
Kokai Jitsuyo Shinan Koho	1971-2012	Toroku Jitsuyo Shinan Koho	1994-2012

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2010/103620 A1 (Glory Ltd.), 16 September 2010 (16.09.2010), paragraphs [0042], [0048] to [0049] & CN 102348605 A	1-8
A	WO 2011/039833 A1 (Glory Ltd.), 07 April 2011 (07.04.2011), paragraphs [0067] to [0068] (Family: none)	1-8

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 June, 2012 (20.06.12)	10 July, 2012 (10.07.12)
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2010103620 A **[0002]**
- WO 2011039833 A **[0002]**
- JP 6441094 A **[0002] [0003]**