

DescriptionField of the Invention

[0001] The present invention relates to a label dispensing device for dispensing labels to a medicine tray.

Background of the Invention

[0002] There is known in the art a medicine supply system configured to dispense medicines such as injection, etc. to a medicine tray conveyed on a tray conveying line and to allow a label dispensing device to print information corresponding to the medicine on a label with a printer so as to dispense the label to the medicine tray (see, e.g., Patent Document 1). There is also known in the art a medicine tray, the inside of which is partitioned into a plurality of sections by partition plates, etc., as well as a medicine tray, the inside of which is not partitioned into sections. Patent Document 2 describes a label dispensing device intended for a medicine tray that is partitioned into a plurality of sections.

[0003] However, the label dispensing device described in Patent Document 2 achieves inputting labels to each section by moving the medicine tray. Thus, it cannot efficiently dispense the labels. Further, Patent Document 2 has no teaching as to making it easy to dispense the labels when paper shortage of a printer occurs. Furthermore, the label dispensing device of Patent Document 2 must move big-sized medicine trays. Accordingly, it must be large-scaled and requires a sufficient space for installation.

Patent Document 1: Japanese Laid-Open Patent Application No. Heisei 06-183568

Patent Document 2: Japanese Laid-Open Patent Application No. 2006-109899

Summary of the Invention

[0004] It is an object of the present invention to provide a label dispensing device, which can efficiently dispense a label to a medicine tray partitioned into a plurality of sections and continue dispensing the label when paper shortage of a printer occurs, while achieving space-effectiveness.

[0005] The present invention provides a label dispensing device including: a tray holding portion for holding a medicine tray partitioned into a plurality of sections arranged along a predetermined direction; a plurality of fixed print portions disposed above the tray holding portion, the print portion performing printing on a label and supplying the label after printing through a supply opening; and a dispensing portion disposed between the tray holding portion and the printer portions, the dispensing portion including a plurality of openable and closable label receiving portions and being movable in the predetermined direction. The label dispensing device performs a supply operation of supplying the label from the supply opening of the print portion to the label receiving portion of the dispensing portion in a closed position. It also performs a dispensing operation of switching the label receiving portion of the dispensing portion from the closed position to an open position to drop the label to the section of the medicine tray held in the tray holding portion.

[0006] The medicine tray is fixedly held on the tray holding portion. That is, inputting the label to each section of the dispensing portion is achieved without any movement of the medicine tray. Thus, it is possible to dispense the label with high efficiency. Further, to dispense the label, neither the dispensing portion nor the print portion needs to be moved. Only the dispensing portion is moved to dispense the label, thereby accomplishing space-effectiveness (saving installation space) provided by miniaturization of the device.

[0007] Preferably, a movable range of the dispensing portion is within the tray held in the tray holding portion.

[0008] According to such construction, when the dispensing portion is moved, the dispensing portion does not protrude from the medicine tray held in the tray holding portion, thereby accomplishing more space-effectiveness.

[0009] The print portion may comprise a first print portion and a second print portion wherein the supply openings are arranged in the predetermined direction. The dispensing portion may comprise a first label receiving portion and a second label receiving portion, which are arranged in the predetermined direction.

[0010] According to such construction, where any one of the first and second print portions cannot supply the label due to paper shortage, it is possible to dispense the label to each section of the medicine tray by repeating the supply operation for the label in the other print portion and the discharge operation for the label supplied as such.

[0011] More specifically, an arrangement order of the first and second print portions, when viewed in the predetermined direction, is identical to an arrangement order of the first and second label receiving portions when viewed in the predetermined direction. The dispensing portion is movable in the predetermined direction between the following positions: a reference position where the first label receiving portion is positioned below the supply opening of the first print portion and the supply portion of the second label is positioned below the supply opening of the second print portion; a first shift position where the first label receiving portion is positioned below the supply opening of the second print portion; and a second shift position where the second label receiving portion is positioned below the supply opening of the first printer

portion.

[0012] According to such construction, the label is dispensed to each section of the medicine tray through the supply operation of supplying the label from the first and second print portions to the first and second label receiving chambers of the dispensing portion disposed in any one of the reference position, the first shift position and the second shift position and the discharge operation of dropping the label from the first and second label receiving chambers of the dispensing portion disposed in any one of the reference position, the first shift position and the second shift position to any one of the sections of the medicine tray. Thus, it is possible to dispense the label with high efficiency.

[0013] The tray held in the tray holding portion includes first to fourth sections arranged in the predetermined direction. In such a case, the label dispensing device repeats a supply operation and a discharge operation to thereby dispense the label to the first to fourth sections. The supply operation supplies the label from at least one of the first and second print portions to at least one of the first and second label receiving chambers in the closed position of the dispensing portion disposed in any one of the reference position, the first shift position and the second shift position. The discharge operation puts the label receiving portion disposed in any one of the reference position, the first shift position and the second shift position into the open position to drop the label from the at least one of the first and second label receiving chambers to at least one of the first to fourth sections of the medicine tray held in the tray holding portion.

[0014] Preferably, a concavo-convex shape is provided in a surface of the label receiving portion, on which the label is placed.

[0015] According to such construction, a contact area between the label supplied from the print portion to the label receiving portion and the surface of the label receiving portion, on which the label is placed, is reduced. That is, a contact area between air and the surface of the label placed on the label receiving portion increases. As a result, the label supplied from the print portion is prevented from adhering to the label receiving portion. With such anti-adhesion, when the label receiving portion is switched from the closed position to the open position, the label in the label receiving portion falls to the section of the medicine tray. That is, with such simple construction wherein the concavo-convex shape is provided in the surface of the label receiving portion placing the label thereon, an error due to adhesion in the operation of dispensing the label can be prevented.

[0016] The dispensing portion may include: a shutter constituting a bottom portion of the label receiving portion and being switched between the open position and the closed position; and an opening formed through the shutter in a thickness direction thereof.

[0017] By providing the opening in the shutter, a contact area between the label supplied from the print portion and the shutter can be reduced (a contact area between air and a surface of the label facing the shutter can increase). Thus, the adhesion of the label to the shutter can be prevented. Accordingly, when the shutter is switched from the closed position to the open position, the label in the label receiving portion falls to the section of the medicine tray. That is, with such simple construction wherein the opening is provided in the shutter, an error due to adhesion in the operation of dispensing the label can be prevented.

[0018] Preferably, the dispensing portion includes an insertion portion, which is apart from the opening when the shutter is in the closed position and is inserted to the opening when the shutter is in the open position.

[0019] According to such construction, when the shutter goes into the opened position, the label placed on the shutter, although adhering thereto, is compulsorily separated from the shutter by the insertion portion inserted through the opening and then falls to the section of the medicine tray. That is, with such construction, an error due to adhesion in the operation of dispensing the label can be better prevented.

[0020] According to the label dispensing device of the present invention, it is possible to efficiently dispense the label to the medicine tray partitioned into a plurality of sections and to continue dispensing the label when paper shortage of a printer occurs. Further, the label dispensing device can achieve space-effectiveness.

Brief Description of the Drawings

[0021]

FIG. 1 is a schematic plan view showing a medicine supply system including a label dispensing device according to a first embodiment of the present invention.

FIG. 2 is a schematic diagram showing the label dispensing device according to the first embodiment of the present invention.

FIG. 3 is a plan view showing the label dispensing device according to the first embodiment of the present invention.

FIG. 4 is a front view showing the label dispensing device according to the first embodiment of the present invention.

FIG. 5 is a left side view showing the label dispensing device according to the first embodiment of the present invention.

FIG. 6 is a perspective view showing a medicine tray and a tray holding portion.

FIG. 7 is a perspective view showing the tray holding portion.

FIG. 8 is a perspective view showing a first printer portion and a second printer portion.

FIG. 9 is a perspective view showing a stocker.

FIG. 10 is a schematic diagram showing "a reference position," "a right shift position" and "a left shift position" of the stocker in a supply operation.

FIG. 11 is a schematic diagram showing "a reference positions," "a right shift position" and "a left shift position" of the stocker in a discharge operation.

FIG. 12A is a schematic diagram showing a dispensing operation (the first supply operation) when the first and second printer portions operate normally.

FIG. 12B is a schematic diagram showing a dispensing operation (the first discharge operation) when the first and second printer portions operate normally.

FIG. 12C is a schematic diagram showing a dispensing operation (the second supply operation) when the first and second printer portions operate normally.

FIG. 12D is a schematic diagram showing a dispensing operation (the second discharge operation) when the first and second printer portions operate normally.

FIG. 13A is a schematic diagram showing a dispensing operation (the first supply operation) when only the first printer portion operates normally.

FIG. 13B is a schematic diagram showing a dispensing operation (the first discharge operation) when only the first printer portion operates normally.

FIG. 13C is a schematic diagram showing a dispensing operation (the second supply operation) when only the first printer portion operates normally.

FIG. 13D is a schematic diagram showing a dispensing operation (the second discharge operation) when only the first printer portion operates normally.

FIG. 13E is a schematic diagram showing a dispensing operation (the third supply operation) when only the first printer portion operates normally.

FIG. 13F is a schematic diagram showing a dispensing operation (the third discharge operation) when only the first printer portion operates normally.

FIG. 13G is a schematic diagram showing a dispensing operation (the fourth supply operation) when only the first printer portion operates normally.

FIG. 13H is a schematic diagram showing a dispensing operation (the fourth discharge operation) when only the first printer portion operates normally.

FIG. 14A is a schematic diagram showing a dispensing operation (the first supply operation) when only the second printer portion operates normally.

FIG. 14B is a schematic diagram showing a dispensing operation (the first discharge operation) when only the second printer portion operates normally.

FIG. 14C is a schematic diagram showing a dispensing operation (the second supply operation) when only the second printer portion operates normally.

FIG. 14D is a schematic diagram showing a dispensing operation (the second discharge operation) when only the second printer portion operates normally.

FIG. 14E is a schematic diagram showing a dispensing operation (the third supply operation) when only the second printer portion operates normally.

FIG. 14F is a schematic diagram showing a dispensing operation (the third discharge operation) when only the second printer portion operates normally.

FIG. 14G is a schematic diagram showing a dispensing operation (the fourth supply operation) when only the second printer portion operates normally.

FIG. 14H is a schematic diagram showing a dispensing operation (the fourth discharge operation) when only the second printer portion operates normally.

FIG. 15 is an upper perspective view showing a label dispensing device according to a second embodiment of the present invention.

FIG. 16 is a lower perspective view showing the label dispensing device according to the second embodiment of the present invention.

FIG. 17 is a schematic plan view showing one of shutter plates.

FIG. 18 is a sectional view taken along the line XVIII-XVIII of FIG. 17.

Details of the Invention

(FIRST EMBODIMENT)

[0022] FIG. 1 shows a medicine supply system 2 including a label dispensing device 1 according to a first embodiment of the present invention. In the medicine supply system 2, a plurality of medicine dispensing devices 5, a label dispensing

device 1, a card rewriting device 6 and a stack lifter 7 are disposed on the way of a tray conveying line 10 connecting a medicine tray supply device 3 and a medicine tray discharge device 4. A medicine tray 8 supplied from the medicine tray supply device 3 are conveyed through the tray conveying line 10. The medicine tray passes through the medicine dispensing devices 5, the label dispensing device 1, the card rewriting device 6 and the stack lifter 7 in that sequence and then arrives at the medicine tray discharge device 4.

[0023] Referring to FIG. 6, the medicine tray 8 is a plastic container having a shape of a rectangular bucket with a bottom when viewed from above. A flange portion 8a is formed at an upper opening of the medicine tray is formed at an upper opening. Further, the medicine tray has grooves at both sides thereof. The medicine tray is configured to be partitioned into a plurality of receiving sections according to dosage time by attaching the partition plates 9 in the medicine tray. In this embodiment, the medicine tray 8 is partitioned into four sections 11a to 11d in a conveyance direction (direction of X-axis) of the medicine tray 8 by means of three partition plates 9. In the accompanying drawings, the sections 11a to 11d are denoted by "No 1" to "No 4," respectively.

[0024] The medicine tray supply device 3 supplies a plurality of the medicine trays 8, which are received as stacked up, to the tray conveying line 10 one after the other.

[0025] The medicine dispensing device 5 dispenses medicines (e.g., an injection, etc.) to each corresponding section 11a to 11d of the medicine tray 8 conveyed on the tray conveying line 10 one pack at a time based on a prescription data inputted from a server or the like.

[0026] The label dispensing device 1 dispenses a label, which is associated with the medicines dispensed by the medicine dispensing device 5, to each section 11a to 11d of the medicine tray 8.

[0027] The card rewriting device 6 is configured to print predetermined items on an identification card (not shown) provided on the medicine tray 8. Although already printed, the card rewriting device can rewrite and reprint the contents (for more details, see, e.g., Japanese Laid-Open Patent Publication No. 2002-165865).

[0028] The stack lifter 7 is configured to stack the medicine trays 8, which are conveyed thereto with the medicine contained therein, and to have them standby and then to sequentially supply the medicine trays to the medicine tray discharge device 4 (for more details, see, e.g., Japanese Laid-Open Patent Publication No. 2002-240946).

[0029] The medicine tray discharge device 4 comprises a cart standby section 4a and a tray supply section 4b. The medicine tray discharge device sequentially stores the medicine trays 8 with medicines and labels contained therein in an empty delivery cart (not shown) (for more details, see International Laid-Open Patent Publication No. 2005/105629).

[0030] Hereinafter, the label dispensing device 1 according to the first embodiment will be described in detail. Referring to FIGS. 2 to 5, the label dispensing device 1 includes a tray holding portion 21, a first printer portion (first print portion) 22A, a second printer portion (second print portion) 22B and a stocker (dispensing portion) 23.

[0031] Referring further to FIGS. 6 and 7, the tray holding portion 21 constitutes a portion of the tray conveying line 10. The tray holding portion maintains the medicine tray 8 conveyed from the card rewriting device 6 stationary during dispensing labels, and moves the same to the stack lifter 7 after dispensing the labels.

[0032] As clearly shown in FIG. 2, the first and second printer portions 22A, 22B are provided on a common base 25 disposed above the tray holding portion 21 at a spacing therebetween. Referring further to FIG. 8, the first and second printer portions 22A, 22B include a roll 26 with wound paper and a printer body 27. The printer body performs printing on the paper unwound from the roll and then cuts the same thereby producing labels (schematically shown with reference symbol "L" in 12 to 1h). The labels L cut in the printer bodies 27 of the first and second printer portions 22A, 22B fall to the stocker 23 from the first supply hole (first supply opening) 28A and the second supply hole (second supply opening) 28B which are vertically through the base 25. As most clearly shown in FIGS. 10 and 11, the first supply hole 28A and second supply hole 28B are adjacent in the X-axis direction (an arrangement direction of the sections 11a to 11d of the medicine tray 8 held in the tray holding portion 21 as described above), while being out of line in the Y-axis direction orthogonal to the X-axis direction.

[0033] During operation of the label dispensing device 1, the base 25 of the first and second printer portions 22A, 22B is fixed in a fixed position. In such a fixed state, as schematically shown in FIG. 2, the first supply hole 28A of the first printer portion 22A is positioned above the section 11b positioned secondly from right in the figures of the medicine tray 8, which is held in the tray holding portion 21. Further, in such a fixed state, the second supply hole 28B of the second printer portion 22B is positioned above the section 11c positioned thirdly from right in the figures of the medicine tray 8 which is held in the tray holding portion 21. That is, the first supply hole 28A of the first printer portion 22A and the second supply hole 28B of the second printer portion 22B are in positional alignment with the section 11b and the section 11c of the medicine tray 8 which are held in the tray holding portion 21 respectively.

[0034] As most clearly shown in FIG. 2, the stocker 23 is disposed between the tray holding portion 21 and the base 25 of the first and second printer portions 22A, 22B. Specifically, the stocker 23 is disposed above the tray holding portion 21 at a spacing allowing a shutter 41 (this will be described below) to open. Further, the stocker is disposed relative to the base 25 of the first and second printer portions 22A, 22B with a spacing allowing movement of the stocker 23, which will be described below. Referring further to FIG. 9, the stocker 23 includes a carriage 30 movable on a pair of guide rods 29, 29, which horizontally extends along the arrangement direction (the X-axis direction in the figures) of the sections

11a to 11d of the medicine tray 8 held in the tray holding portion 21. The carriage 30 can move on the guide rods 29, 29 by a known linear drive mechanism including a motor and a transmission mechanism. As described in detail below, the carriage 30 (stocker 23) is moved by the linear drive mechanism 31 and is positioned at any one of three positions.

[0035] A first label receiving chamber 32A and a second label receiving chamber 32B, which are open at an upper end, are provided in the carriage 30. The first label receiving chamber 32A and the second label receiving chamber 32B are adjacently disposed in the arrangement direction of the sections 11a to 11d of the medicine tray 8 held in the tray holding portion 21. Main partitions 34a, 34b, which are divided into two parts, are disposed between the first and second label receiving chambers. Further, a sub partition 35 extending orthogonally to the main partitions 34a, 34b is provided in the carriage 30. The sub partition 35 divides the first label receiving chamber 32A into a first sub chamber 36a and a second sub chamber 36b. Likewise, the sub partition 35 divides the second label receiving chamber 32B into a third sub chamber 36c and a fourth sub chamber 36d. In the accompanying drawings, the first to fourth sub chambers 36a to 36d are denoted by Od, Ev', Ev, Od', respectively. As most clearly shown in FIGS. 10 to 11, when viewed in the arrangement direction (the X direction) of the sections 11a to 11d of the medicine tray 8, both the arrangement order of the first and second supply openings 28A, 28B of the first and second printer portions 22A, 22B and the arrangement order of the first and second label receiving chambers 32A, 32B are identical to the arrangement order of the sections 11a to 11d of the medicine tray 8.

[0036] Bottom portions of the first label receiving chamber 32A and the second label receiving chamber 32B comprise a shutter 41. In this embodiment, the shutter 41 includes two shutter plates 42a, 42b. As clearly shown in FIGS. 9 and 11, one shutter plate 42a constitutes bottom portions of the first sub chamber 36a of the first label receiving chamber 32A and the fourth sub chamber 36d of the second label receiving chamber 32B. Further, the other shutter plate 42b constitutes bottom portions of the second sub chamber 36b of the first label receiving chamber 32A and the third sub chamber 36c of the second label receiving chamber 32B. The two shutter plates 42a, 42b are rotatably connected to the carriage 30 around a shaft 33, a base end of which extends in the X-axis direction. As the shutter plates 42a, 42b are rotated by a known rotary drive mechanism 43 including a motor and a transmission mechanism, the shutter 41 is switchable between a closed position where the shutter closes lower openings of the first label receiving chamber 32A and second label receiving chamber 32B and an open position where the shutter opens the lower openings of the first label receiving chamber 32A and second label receiving chamber 32B. When the shutter is in the closed position, the labels L are held in the first and second label receiving chambers 32A, 32B (in the first to fourth sub chambers 36a to 36d). In contrast, when the shutter is in the open position, the labels L in the first and second label receiving chambers 32A, 32B (in the first to fourth sub chambers 36a to 36d) fall downward.

[0037] Referring to FIG. 9, an upper surface of each shutter plate 42a, 42b on which the label L is placed is not a flat surface, but has a concavo-convex shape. Specifically, three anti-adhesion plates having a shape of a thin and elongated strip are attached in each upper surface of the shutter plates 42a, 42b for every first to fourth sub chambers 36a to 36d. Since these anti-adhesion plates 101 are provided, a contact area between the labels L received in the first and second label receiving chambers 32A, 32B and the upper surfaces of the shutter plates 42a, 42b decreases. That is, a contact area between air and the lower surfaces (surfaces placed on the shutter plates 42a, 42b) of the labels L increases. Thus, the labels L are prevented from adhering to the upper surfaces of the shutter plates 42a, 42b. A detailed shape of the anti-adhesion plate 101 will be described when describing a second embodiment which will be described below.

[0038] The main partitions 34a, 34b are fixed to the shutter plates 42a, 42b and are moved along with rotation of the shutter plates 42a, 42b. Meanwhile, the sub partition 35 is fixed to the carriage 30 and maintains a fixed position regardless of whether the shutter plates 42a, 42b are open or closed.

[0039] The labels L, which are supplied from the first and second printer portions 22A, 22B, fall to the stocker 23, specifically, to the first and second label receiving chambers 32A, 32B (the first to fourth sub chambers 36a to 36d) with the shutter 41 closed through the first and second supply holes 28A, 28B and is then received therein (supply operation). When the shutter 41 is switched from the closed position to the open position, the labels L received in the stocker 23, specifically, in the first and second label receiving chambers 32A, 32B (the first to fourth sub chambers 36a to 36d) fall from the first and second label receiving chambers 32A, 32B (the first to fourth sub chambers 36a to 36d) to the sections 11a to 11d of the medicine tray 8 held in the tray holding portion 21 (discharge operation). By repeating such supply operation and discharge operation, the labels L are dispensed to the sections 11a to 11d of the medicine tray 8 held in the tray holding portion 21. As described above, the labels L are prevented from adhering to the shutter plates 42a, 42b by the anti-adhesion plate 101. Thus, when the shutter 41 is switched from the closed position to the open position, the labels L in the first and second label containers 32A, 32B fall to the sections 11a to 11d of the medicine tray 8, thereby not causing an error in the discharge operation due to adhesion to the shutter plates 42a, 42b.

[0040] Referring to FIGS. 10 and 11, in both the supply operation and discharge operation, the stocker 23 is moved by the linear drive mechanism 31 to thus be positioned in any one of three positions, that is, "a reference position", "a right shift position (first shift position)" and "a left shift position (second shift position)."

[0041] In the "reference position," the first label receiving chamber 32A (the first and second sub chambers 36a, 36b) of the stocker 23 is positioned right above the section 11b of the medicine tray 8 held in the tray holding portion 21, while

the second label receiving chamber 32B (the third and fourth sub chambers 36c, 36d) is positioned right above the section 11c of the medicine tray 8 held in the tray holding portion 21. Further, in the "reference position," the first sub chamber 36a of the first label receiving chamber 32A of the stocker 23 is positioned right below the first supply hole 28A of the first printer portion 22A, while the third sub chamber 36c of the second label receiving chamber 32B is positioned right below the second supply hole 28B of the second printer portion 22B.

[0042] In the "right shift position," the first label receiving chamber 32A (the first and second sub chambers 36a, 36b) of the stocker 23 is positioned right above the section 11a of the medicine tray 8 held in the tray holding portion 21, while the second label receiving chamber 32B (the third and fourth sub chambers 36c, 36d) is positioned right above the section 11b of the medicine tray 8 held in the tray holding portion 21. Further, in the "right shift position," the fourth sub chamber 36d of the second label receiving chamber 32B of the stocker 23 is positioned right below the first supply hole 28A of the first printer portion 22A.

[0043] In the "left shift position," the first label receiving chamber 32A (the first and second sub chambers 36a, 36b) of the stocker 23 is positioned right above the section 11c of the medicine tray 8 held in the tray holding portion 21, while the second label receiving chamber 32B (the third and fourth sub chambers 36c, 36d) is positioned right above the section 11d of the medicine tray 8 held in the tray holding portion 21. Further, in the "left shift position," the second sub chamber 36b of the first label receiving chamber 32A of the stocker 23 is positioned right below the second supply hole 28B of the second printer portion 22B.

[0044] A movable range of the stocker 23 in the X direction (the arrangement direction of the sections 11a to 11d of the medicine tray 8) is between the aforementioned "right shift position" and "left shift position." Further, as shown in FIGS. 10 and 11, in the "right shift position," an end of the first label receiving chamber 32A (end located right in those figures) of the stocker 23 is approximately aligned with an end of the section 11a (end located right in those figures) of the medicine tray 8 held in the tray holding portion 21, whereas an end of the second label receiving chamber 32B (end located left in those figures) of the stocker 23 is much inner than a left end of the medicine tray 8 (near a boundary between the section 11b and the section 11d). Further, in the "left shift position", an end of the second label receiving chamber 32B of the stocker 23 is approximately aligned with an end of the section 11d of the medicine tray 8 held in the tray holding portion 21, whereas an end of the first label receiving chamber 32A of the stocker 23 is much inner than a right end of the medicine tray 8 (near a boundary between the section 11a and the section 11b). As described above, the movable range of the stocker 23 in the X direction (the arrangement direction of the sections 11a to 11d of the medicine tray 8) is within a range of the medicine tray 8 held in the tray holding portion 21 in the X direction. In other words, although the stocker 23 is positioned in any position within the movable range in the X direction, the stocker 23 is located within the medicine tray 8 when viewed from above. That is, when the stocker 23 is moved within the movable range in the X direction, the stocker 23 does not protrude out of the medicine tray 8 held by the tray holding portion 22, thereby achieving space-effectiveness of the label dispensing device 1.

[0045] Referring to broken-lined arrows shown in FIG. 10, when the stocker 23 is in the "reference position" during the supply operation, the label L can be supplied from the first supply hole 28A of the first printer portion 22A to the first sub chamber 36a of the first label receiving chamber 32A. Further, the label L can be supplied from the second supply hole 28B of the second printer portion 22B to the third sub chamber 36c of the second label receiving chamber 32A. Moreover, when the stocker 23 is in the "right shift position" during the supply operation, the label L can be supplied from the first supply hole 28A of the first printer portion 22A to the fourth sub chamber 36d of the second label receiving chamber 32B. Furthermore, when the stocker 23 is in the "left shift position" during the supply operation, the label L can be supplied from the second supply hole 28B of the second printer portion 22B to the second sub chamber 36b of the first label receiving chamber 32A.

[0046] Referring to broken-lined arrows shown in FIG. 11, when the stocker 23 is in the "reference position" during the discharge operation, the label L in the first label receiving chamber 32A (the first and second sub chambers 36a, 36b) falls to and is then received in the section 11b of the medicine tray 8 held in the tray holding portion 21, and the label L in the second label receiving chamber 32B (the third and fourth sub chambers 36c, 36d) falls to and is then received in the section 11c of the medicine tray 8 held in the tray holding portion 21. Further, when the stocker 23 is in the "right shift position" during the discharge operation, the label L in the first label receiving chamber 32A (the first and second sub chambers 36a, 36b) falls to and is then received in the section 11a of the medicine tray 8 held in the tray holding portion 21, and the label L in the second label receiving chamber 32B (the third and fourth sub chambers 36c, 36d) falls to and is then received in the section 11b of the medicine tray 8 held in the tray holding portion 21. Furthermore, when the stocker 23 is in the "left shift position" during the discharge operation, the label L in the first label receiving chamber 32A (the first and second sub chambers 36a, 36b) falls to and is then received in the section 11c of the medicine tray 8 held in the tray holding portion 21, and the label L in the second label receiving chamber 32B (the third and fourth sub chambers 36c, 36d) falls to and is then received in the section 11d of the medicine tray 8 held in the tray holding portion 21.

[0047] Hereinafter, an operation of the label dispensing device will be described.

[0048] First, with reference to FIGS. 12A to 12D, descriptions will be made as to that both the first printer portion 22A

and the second printer portions 22B are not short of paper and thus labels L can be normally supplied. FIGS. 12A and 12C show the supply operation, while FIGS. 12B and 12D show the discharge operation subsequent thereto.

[0049] In the first supply operation shown in FIG. 12A, the stocker 23 is in the "reference position" and the shutter 41 is in the closed position. In such a state, the label L is supplied from the first supply hole 28A of the first printer portion 22A to the first sub chamber 36a of the first label receiving chamber 32A. Further, the label L is supplied from the second supply hole 28B of the second printer portion 22B to the third sub chamber 36c of the second label receiving chamber 32B. When the first supply operation is completed, the stocker 23 is moved from the "reference position" to the "right shift position" by the linear drive mechanism 31.

[0050] Subsequently, the first discharge operation shown in FIG. 12B is performed. As described above, the stocker 23 is in the "right shift position." In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the first sub chamber 36a of the first label receiving chamber 32A falls to and is then received in the section 11a of the medicine tray 8 held in the tray holding portion 21. Further, the label L in the third sub chamber 36c of the second label receiving chamber 32B falls to and is then received in the section 11b of the medicine tray 8 held in the tray holding portion 21. When the first discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Moreover, the stocker 23 is moved from the "right shift position" to the "reference position" by the linear drive mechanism 31.

[0051] Next, the second supply operation shown in FIG. 12C is performed. As described above, the stocker 23 is in the "reference position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the first supply hole 28A of the first printer portion 22A to the first sub chamber 36a of the first label receiving chamber 32A. Further, the label L is supplied from the second supply hole 28B of the second printer portion 22B to the third sub chamber 36c of the second label receiving chamber 32B. When the second supply operation is completed, the stocker 23 is moved from the "reference position" to the "left shift position" by the linear drive mechanism 31.

[0052] Finally, the second discharge operation shown in FIG. 12D is performed. As described above, the stocker 23 is in the "left shift position". In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the first sub chamber 36a of the first label receiving chamber 32A falls to and is then received in the section 11c of the medicine tray 8 held in the tray holding portion 21. Further, the label L in the third sub chamber 36c of the second label receiving chamber 32B falls to and is then received in the section 11d of the medicine tray 8 held in the tray holding portion 21. When the second discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 is moved from the "left shift position" to the "reference position" by the linear drive mechanism 31.

[0053] Through the above-described operations shown in FIGS. 12A to 12D, the labels L are dispensed from the first and second printer portions 22A, 22B to all of the sections 11a to 11d of the medicine tray 8 held in the tray holding portion 21.

[0054] Hereinafter, with reference to FIGS. 13A to 13H, descriptions will be made as to that the second printer portion 22B cannot supply labels L due to paper shortage and only the first printer portion 22A dispenses labels L to all of the sections 11a to 11d of the medicine tray 8. FIGS. 13A, 13C, 13E and 13G show the supply operation, while FIGS. 13B, 13D, 13F and 13H show the discharge operation subsequent thereto respectively.

[0055] In the first supply operation shown in FIG. 13A, the stocker 23 is in the "reference position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the first supply hole 28A of the first printer portion 22A to the first sub chamber 36a of the first label receiving chamber 32A. When the first supply operation is completed, the stocker 23 is moved from the "reference position" to the "right shift position" by the linear drive mechanism 31.

[0056] Subsequently, the first discharge operation in FIG. 13B is performed. As described above, the stocker 23 is in the "right shift position." In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the first sub chamber 36a of the first label receiving chamber 32A falls to and is then received in the section 11a of the medicine tray 8 held in the tray holding portion 21. When the first discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 is moved from the "right shift position" to the "reference position" by the linear drive mechanism 31.

[0057] Next, the second supply operation shown in FIG. 13C is performed. As described above, the stocker 23 is in the "reference position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the first supply hole 28A of the first printer portion 22A to the first sub chamber 36a of the first label receiving chamber 32A. Although the second supply operation is completed, the stocker 23 is maintained in the "reference position."

[0058] Subsequently, the second discharge operation shown in FIG. 13D is performed. As described above, the stocker 23 is in the "reference position." In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the first sub chamber 36a of the first label receiving chamber 32A falls to and is then received in the section 11b of the medicine tray 8 held in the tray holding portion 21. When the second discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 is maintained in the "reference position."

[0059] Next, the third supply operation shown in FIG. 13E is performed. As described above, the stocker 23 is in the "reference position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the first supply hole 28A of the first printer portion 22A to the first sub chamber 36a of the first label receiving chamber 32A. When the third supply operation is completed, the stocker 23 is moved from the "reference position" to the "left shift position" by the linear drive mechanism 31.

[0060] Subsequently, the third discharge operation shown in FIG. 13F is performed. As described above, the stocker 23 is in the "left shift position." In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the first sub chamber 36a of the first label receiving chamber 32A falls to and is then received in the section 11c of the medicine tray 8 held in the tray holding portion 21. When the third discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 is moved from the "left shift position" to the "right shift positions" beyond the "reference position."

[0061] Next, the fourth supply operation shown in FIG. 13G is performed. As described above, the stocker 23 is in the "right shift position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the first supply hole 28A of the first printer portion 22A to the fourth sub chamber 36b of the second label receiving chamber 32A. When the fourth supply operation is completed, the stocker 23 is moved from the "right shift position" to the "left shift position" beyond the "reference position" by the linear drive mechanism 31.

[0062] Finally, the fourth discharge operation shown in FIG. 13G is performed. As described above, the stocker 23 is in the "left shift position." In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the fourth sub chamber 36a of the second label receiving chamber 32A falls to and is then received in the section 11d of the medicine tray 8 held in the tray holding portion 21. When the fourth discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 shifted from the "left shift position" to the "reference position."

[0063] Through the above-described operations shown in FIGS. 13A to 13H, the labels L are dispensed from the first printer portion 22A to all of the sections 11a to 11d of the medicine tray 8 held in the tray holding portion 21.

[0064] Hereinafter, with reference to FIGS. 14A to 14H, descriptions will be made as to that the first printer portion 22A cannot supply labels L due to paper shortage and only the second printer portion 22B dispenses labels L to all of the sections 11a to 11d of the medicine tray 8. FIGS. 14A, 14C, 14E and 14G show the supply operation, while FIGS. 14B, 14D, 14F and 14H show the discharge operation subsequent thereto respectively.

[0065] In the first supply operation shown in FIG. 14A, the stocker 23 is in the "left shift position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the second supply hole 28B of the second printer portion 22B to the second sub chamber 36b of the first label receiving chamber 32A. When the first supply operation is completed, the stocker 23 is moved from the "left shift position" to the "right shift position" beyond the "reference position" by the linear drive mechanism 31.

[0066] Subsequently, the first discharge operation shown in FIG. 14B is performed. As described above, the stocker 23 is in the "right shift position." In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the second sub chamber 36b of the second label receiving chamber 32B falls to and is then received in the section 11a of the medicine tray 8 held in the tray holding portion 21. When the first discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 is moved from the "right shift position" to the "reference position" by the linear drive mechanism 31.

[0067] Next, the second supply operation shown in FIG. 14C is performed. As described above, the stocker 23 is in the "reference position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the second supply hole 28B of the second printer portion 22B to the third sub chamber 36c of the second label receiving chamber 32B. When the second supply operation is completed, the stocker 23 is moved from the "reference position" to the "right shift position" by the linear drive mechanism 31.

[0068] Subsequently, the second discharge operation shown in FIG. 14D is performed. As described above, the stocker 23 is in the "right shift position." In this state, the shutter 41 is switched from the closed position to an open position by the rotary drive mechanism 43. As a result, the label L in the third sub chamber 36c of the second label receiving chamber 32B falls to and is then received in the section 11b of the medicine tray 8 held in the tray holding portion 21. When the second discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 is moved from the "right shift position" to the "reference position."

[0069] Next, the third supply operation shown in FIG. 14E is performed. As described above, the stocker 23 is in the "reference position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the second supply hole 28B of the second printer portion 22B to the third sub chamber 36c of the second label receiving chamber 32B. Although the third supply operation is completed, the stocker 23 is maintained in the "reference position."

[0070] Subsequently, the third discharge operation shown in FIG. 14F is performed. As described above, the stocker

23 is in the "reference position." In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the third sub chamber 36b of the second label receiving chamber 32B falls to and is then received in the section 11c of the medicine tray 8 held in the tray holding portion 21. When the third discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 is maintained in the "reference position."

[0071] Next, the fourth supply operation shown in FIG. 14G is performed. As described above, the stocker 23 is in the "reference position" and the shutter 41 is in the closed position. In this state, the label L is supplied from the second supply hole 28B of the second printer portion 22B to the third sub chamber 36c of the second label receiving chamber 32B. When the fourth supply operation is completed, the stocker 23 is moved from the "reference position" to the "left shift position" by the linear drive mechanism 31.

[0072] Finally, the fourth discharge operation shown in FIG. 14H is performed. As described above, the stocker 23 is in the "left shift position." In this state, the shutter 41 is switched from the closed position to the open position by the rotary drive mechanism 43. As a result, the label L in the third sub chamber 36c of the second label receiving chamber 32B falls to and is then received in the section 11d of the medicine tray 8 held in the tray holding portion 21. When the fourth discharge operation is completed, the shutter 41 is switched from the open position to the closed position by the rotary drive mechanism 43. Further, the stocker 23 is moved from the "left shift position" to the "reference position."

[0073] Through the above-described operations shown in FIGS. 14A to 14H, the labels L are dispensed from the second printer portion 22B to all of the sections 11a to 11d of the medicine tray 8 held in the tray holding portion 21

[0074] The label dispensing device 11 according to this embodiment is characterized by the following features.

[0075] The labels L are dispensed to the sections 11a to 11d of the medicine tray 8 by repeating the following operations: the supply operation of supplying the label L from at least one of the first and second printer portions 22A, 22B to at least one of the first and second label receiving chambers 32A, 32B of the stocker 23 positioned in any one of the "reference position," the "right shift position" and the "left shift position"; and the discharge operation of dropping the label L from at least one of the first and second label receiving chambers 32A, 32B of the stocker 23 positioned in any one of the "reference position," the "right shift position" and the "left shift position" to at least one of the sections 11a to 11d of the medicine tray 8 held in the tray holding portion 21. Thus, dispensing of the labels L can be performed efficiently. In particular, as described with reference to FIGS. 12A to 12D, in case both the first printer portion 22A and the second printer portion 22B can supply the labels L at normal time, the labels L can be dispensed to all of the sections 11a to 11d of the medicine tray 8 only by repeating the supply operation and discharge operation two times.

[0076] Further, as described with reference to FIGS. 13A to 13H and FIGS. 14A to 14H, even in case any one of the first and second printer portions 22A, 22B cannot supply the labels L due to paper shortage, the labels L can be dispensed to all of the sections 11a to 11d of the medicine tray 8 by repeating the supply operation and the discharge operation four times by means of another printer portion. That is, although any one of the first and second printer portions 22A, 22B cannot supply labels, dispensing the labels L to the medicine tray 8 can be continued.

[0077] Further, the medicine tray 8 held in the tray holding portion 21 and the base 25 of the first and second printer portions 22A, 22B do not need to move. Instead, only the stocker 23 is moved between three positions of the "reference position", the "left shift position" and "right shift position", thereby achieving space-effectiveness.

(SECOND EMBODIMENT)

[0078] As shown in FIGS. 15 and 16, a label dispensing device according to a second embodiment is different from the first embodiment as to the structure of the stocker. However, except for the structure of the stocker, the label dispensing device according to the second embodiment has the same configuration as the label dispensing device 1 according to the first embodiment described with reference to FIGS. 1 to 14H. In FIGS. 15 and 16, the same elements or parts as those of the first embodiment are denoted by the same reference numerals.

[0079] In this embodiment, openings 103A, 103B are provided in the shutter plates 42a, 42b, which constitute the bottom portions of the first and second label receiving chambers 32A, 32B, and on each upper surface of which the label L (see FIGS. 12A to 14H) is placed. The openings are through the shutter plates in a thickness direction. Further, as most clearly shown in FIGS. 17 and 18, three anti-adhesion plates 101 having a shape of a thin and elongated strip are attached on the upper surface of each shutter 42a, 42b for every first to fourth sub chambers 36a to 36d. Each anti-adhesion plate 101 includes a base portion 101a fixed to the upper surface of the shutter 42a, 42b and a convex piece portion 101b extending obliquely upward from the base portion 101a. Further, two openings 103A, 103B are provided in the shutters 42a, 42b for every first to fourth sub chambers 36a to 36d. In this embodiment, rectangular openings 103A, 103B are disposed between an intermediate anti-adhesion plate 101 and two anti-adhesion plates 101 on either side thereof in every first to fourth sub chambers 36a to 36d.

[0080] Since the anti-adhesion plates 101 are provided, the upper surfaces of the shutter plates 42a, 42b are concavo-convex. Thus, a contact area between the labels L received in the first and second label receiving chambers 32A, 32B and the upper surfaces of the shutter plates 42a, 42b decreases. Further, since the openings 103A, 103B are provided,

the contact area between the labels L and the shutter plates 42a, 42b decreases. As a result, the labels L are prevented from adhering to the upper surfaces of the shutter plates 42a, 42b. With such anti-adhesion, when the shutter 41 (the shutter plates 42a, 42b) is switched from the closed position to the open position, the labels L certainly fall from the first and second label receiving chambers 32A, 32B to the sections 11a to 11d of the medicine tray 8. Thus, an error in the operation of dispensing the labels L can be prevented.

[0081] As most clearly shown in FIG. 16, an insertion member 105A to 105D is fixed to a lower surface of the carriage 30 of the stocker 23 adjacent to the shaft 33 of the shutter plate 42a, 42b for every first to fourth sub chambers 36a to 36d of the first and second label receiving chamber 32A, 32B. Each insertion member 105A, 105B includes: a base portion 105a which is fixed at its base end to the lower surface of the carriage 30 and extends downward (-Z direction); and an insertion portion 105b extending horizontally (X direction) from a leading end of the base portion 105a.

[0082] FIGS. 15 and 16 show that one shutter plate 42a is in the open position and the other shutter plate 42b is in the closed position. As clear from FIG. 15 and FIG. 16, when the shutter plates 42a, 42b are in the closed position, the insertion portions 105a of the insertion members 105A to 105D are apart from the shutter plates 42a, 42b. However, when the shutter plates 42a, 42b go into the open position, the insertion portions 105a of the insertion members 105A to 105D are inserted, from the lower surface of the shutter plate, to the opening 103A of the shutter plate 42a in the first sub chamber 36a, the opening 103A of the shutter plate 42a in the second sub chamber 36b, the opening 103A of the shutter plate 42b in the third sub chamber 36c and the opening 103A of the shutter plate 42b in the fourth sub chamber 36d, respectively. Although the labels L adhere to the shutter plates 42a, 42b, the labels L are compulsorily separated from the shutter plates 42a, 42b and then fall to the sections 11a to 11d of the medicine tray 8. This is because the insertion portions 105a are inserted to the openings 103A to penetrate through the shutter plates 42a, 42b from the lower surface to the upper surface. That is, since the insertion members 105A to 105D are provided, the error in the operation of dispensing labels due to adhesion can be prevented more reliably.

[0083] The present invention should not be limited to the foregoing embodiments and various modifications may be made as enumerated below.

[0084] In the foregoing embodiments, the medicine tray 8 includes four sections 11a to 11d. However, it is possible for the label dispensing device 1 according to the embodiments to perform dispensing labels L to a medicine tray 8 including two sections partitioned by a single partition plate 9. In such a case, insofar as both the first printer portion 22A and the second printer portions 22B normally operate, while the stocker 23 is fixed in the "reference position", dispensing labels L to the medicine tray 8 can be completed by performing the following operation only one time: the supply operation of supplying labels L from the first and second printer portions 22A, 22B to the first and second label receiving chambers 32A, 32B of the stocker 23; and the discharge operation of discharging the labels from the first and second label receiving chambers 32A, 32B to two sections of the medicine tray 8. Further, it is possible for the label dispensing device 1 according to the embodiments to dispense labels L to the medicine tray 8 including five or more sections. In such a case, with increase in the number of sections, the number of the movable positions of the stocker 23 (in the embodiments, three positions of the "reference position," the "right shift position," and the "left shift position") may increase.

[0085] Further, the number of printer portions (in the embodiments, two of the first and second printer portions 22A, 22B), or the number of label receiving chambers (in the embodiments, two of the first and second label receiving chambers 32A, 32B) included in the stocker 23 may be three or more.

[0086] The concavo-convex shape for preventing labels from adhering to the shutter plates 42a, 42b should not be limited to the shape obtained by attaching the anti-adhesion plates 101, 102 as described in the embodiments. Insofar as the contact area between the label L and the shutter plate 42a, 42b can be reduced to the extent of making anti-adhesion, various configurations can be adopted such as a single or a plurality of convex portions, concave portions, etc. to be provided in a shutter plate itself.

Description of reference numerals

[0087]

- | | |
|---|--------------------------------|
| 1 | Label Dispensing Device |
| 2 | Medicine Supply System |
| 3 | Medicine Tray Supply Device |
| 4 | Medicine Tray Discharge Device |
| 5 | Medicine Dispensing Device |

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	6	Card Rewriting Device
	7	Stack Lifter
5	8	Medicine Tray
	8a	Flange Portion
	9	Partition Plate
10	10	Tray Conveying Line
	11a, 11b, 11c, 11d	Section
15	21	Tray Holding Portion
	22A	First Printer Portion
	22B	second Printer Portion
20	23	Stocker
	25	Base
25	26	roll
	27	Printer Body
	28A	First Supply Hole
30	28B	Second Supply Hole
	29	Guide Rod
35	30	Carriage
	31	Linear Drive Mechanism
	32A	First Label Receiving Chamber
40	32B	Second Label Receiving Chamber
	33	Shaft
45	34a, 34b	Main Partition
	35	Sub Partition
	36a to 36d	Sub Chamber
50	41	Shutter
	42a, 42b	Shutter Plate
55	43	Rotary Drive Mechanism
	101	Anti-adhesion Plate

101a	Base Portion
101B	Convex Piece Portion
5 103A, 103B	Opening
L	Label

Claims

1. A label dispensing device, comprising:

a tray holding portion for holding a medicine tray partitioned into a plurality of sections arranged along a predetermined direction;
a plurality of fixed print portions disposed above the tray holding portion, the print portion performing printing on a label and supplying the label after printing through a supply opening; and
a dispensing portion disposed between the tray holding portion and the printer portions, the dispensing portion including a plurality of openable and closable label receiving portions and being movable in the predetermined direction,
wherein the label dispensing device performs a supply operation of supplying the label from the supply opening of the print portion to the label receiving portion of the dispensing portion in a closed position and a dispensing operation of switching the label receiving portion of the dispensing portion from the closed position to an open position to drop the label to the section of the medicine tray held in the tray holding portion.

2. The label dispensing device of Claim 1, wherein a movable range of the dispensing portion is within the tray held in the tray holding portion.

3. The label dispensing device of Claim 1 or 2, wherein the print portion comprises a first print portion and a second print portion wherein the supply openings are arranged in the predetermined direction, and wherein the dispensing portion comprises a first label receiving portion and a second label receiving portion which are arranged in the predetermined direction.

4. The label dispensing device of Claim 3, wherein an arrangement order of the first and second print portions when viewed in the predetermined direction is identical to an arrangement order of the first and second label receiving portions when viewed in the predetermined direction, and wherein the dispensing portion is movable in the predetermined direction between the following positions:

a reference position where the first label receiving portion is positioned below the supply opening of the first print portion and the supply portion of the second label is positioned below the supply opening of the second print portion;
a first shift position where the first label receiving portion is positioned below the supply opening of the second print portion; and
a second shift position where the second label receiving portion is positioned below the supply opening of the first printer portion.

5. The label dispensing device of Claim 4, wherein the tray held in the tray holding portion includes first to fourth sections arranged in the predetermined direction.

6. The label dispensing device of Claim 5, wherein the label dispensing device repeats a supply operation and a discharge operation to thereby dispense the label to the first to fourth sections, wherein the supply operation supplies the label from at least one of the first and second print portions to at least one of the first and second label receiving chambers in the closed position of the dispensing portion disposed in any one of the reference position, the first shift position and the second shift position, wherein the discharge operation puts the label receiving portion disposed in any one of the reference position, the first shift position and the second shift position into the open position to drop the label from the at least one of the first and second label receiving chambers to at least one of the first to fourth sections of the medicine tray held in the tray holding portion.

7. The label dispensing device of any one of Claims 1 to 6, wherein a concavo-convex shape is provided in a surface of the label receiving portion, on which the label is placed.

8. The label dispensing device of any one of Claims 1 to 7, wherein the dispensing portion includes:

5 a shutter constituting a bottom portion of the label receiving portion, the shutter being switched between the open position and the closed position; and
an opening formed through the shutter in a thickness direction thereof.

10 9. The label dispensing device of Claim 8, wherein the dispensing portion includes an insertion portion, the insertion portion being apart from the opening when the shutter is in the closed position, the insertion portion being inserted to the opening when the shutter is in the open position.

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FIG. 1

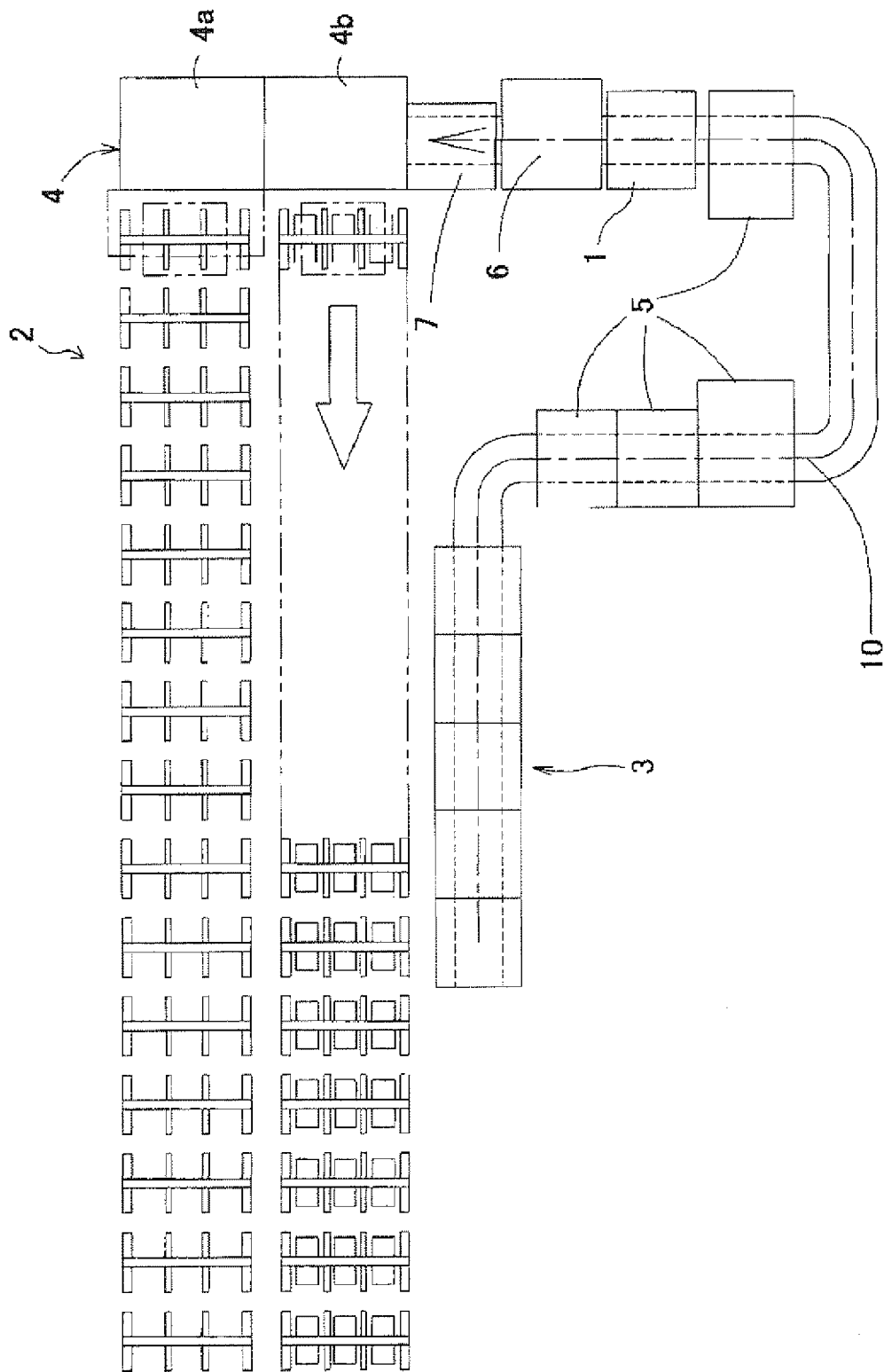


FIG. 2

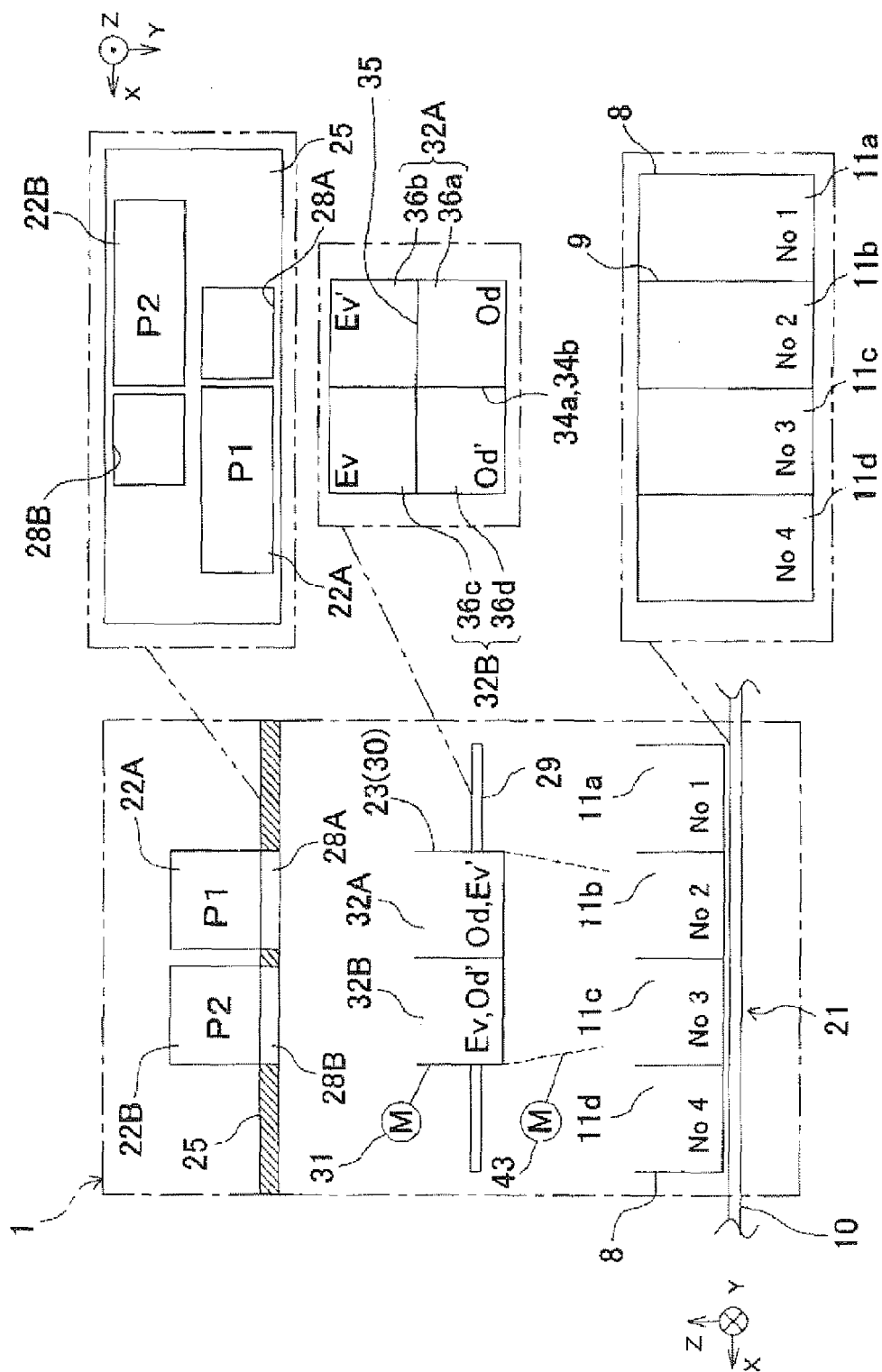


FIG. 3

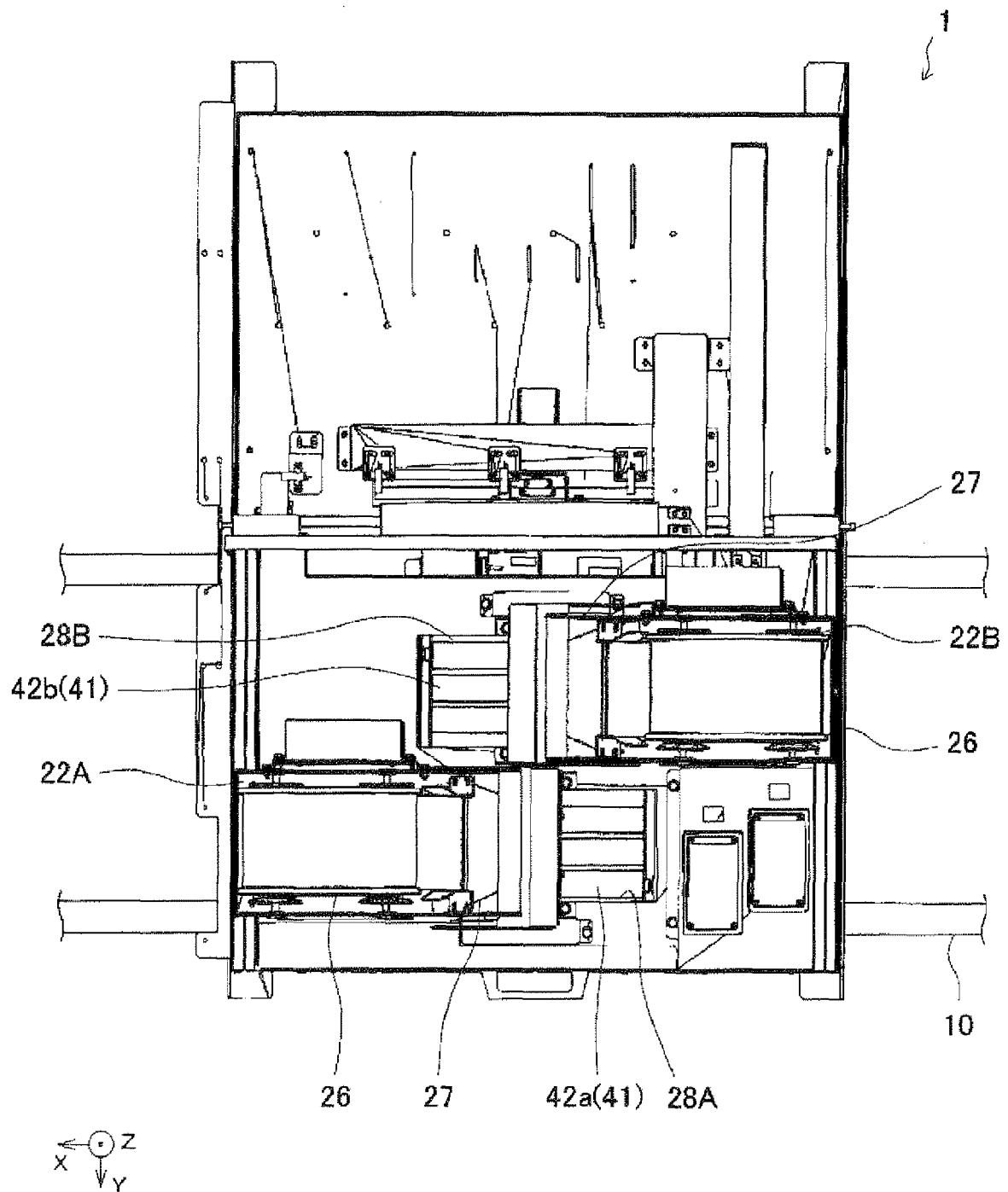


FIG. 4

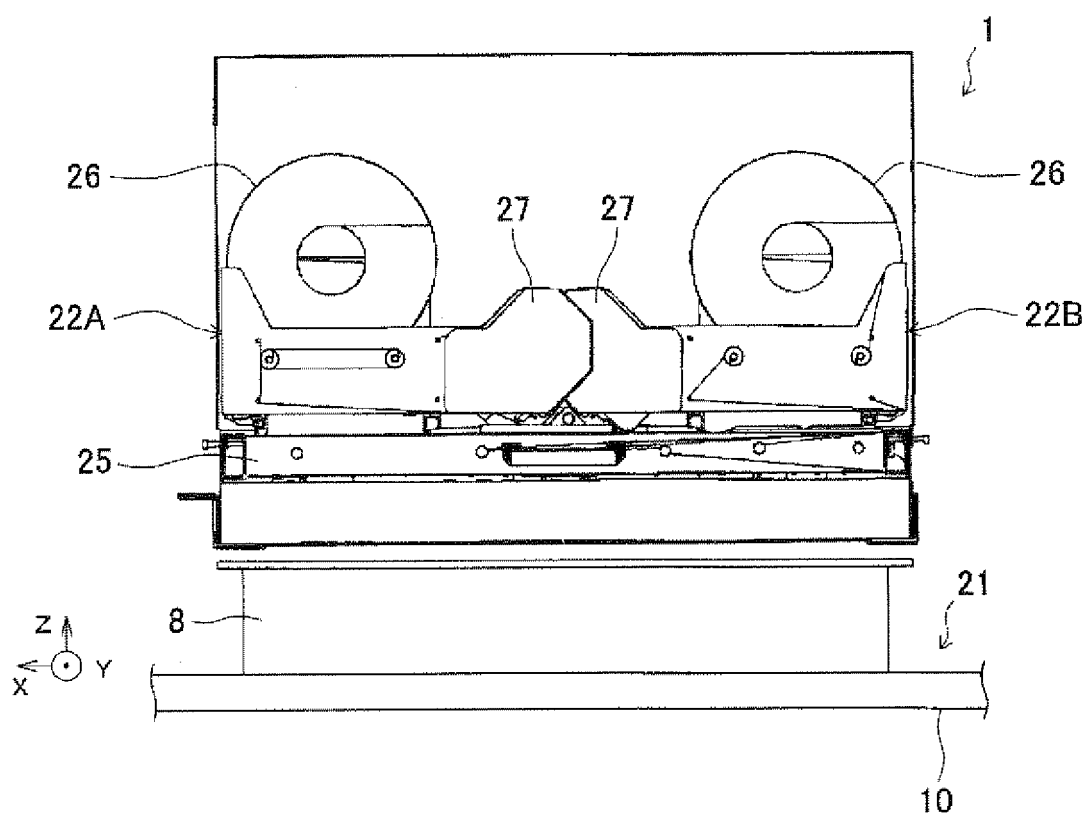


FIG. 5

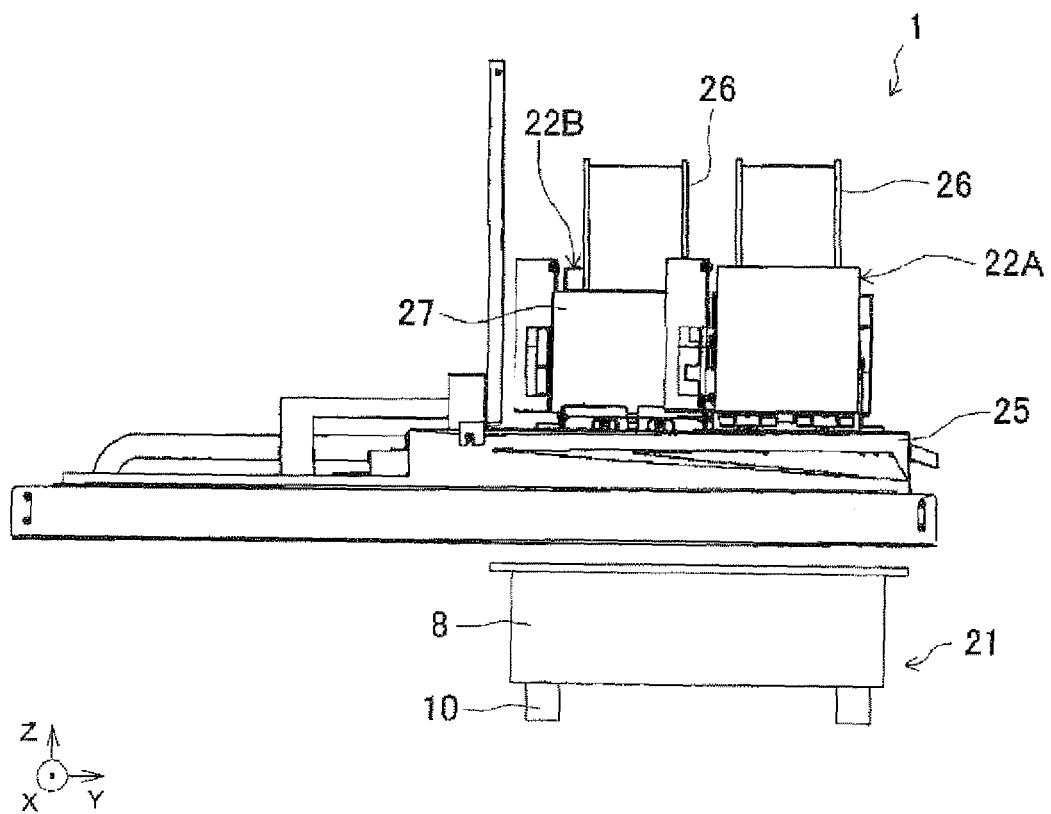


FIG. 6

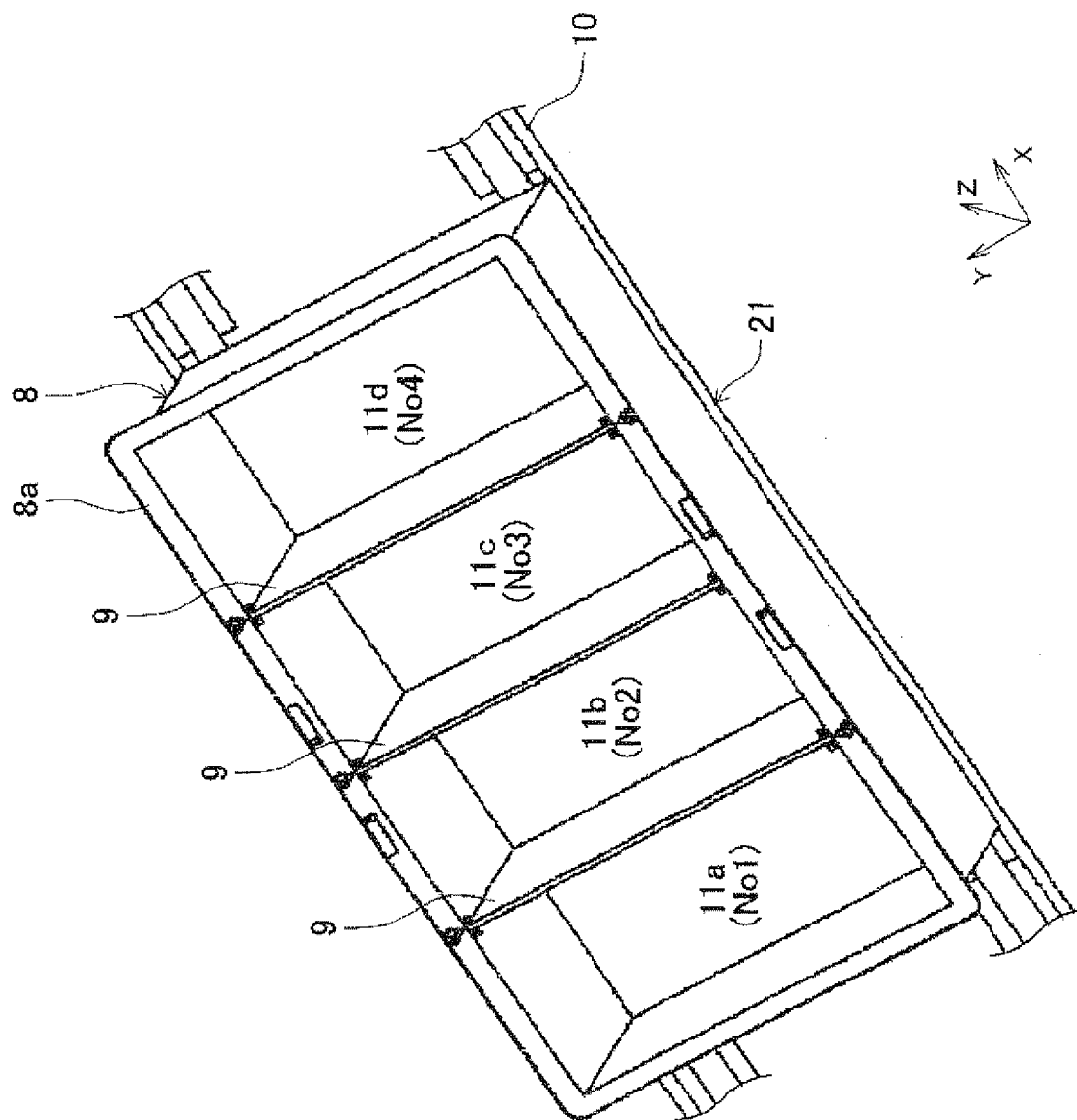


FIG. 7

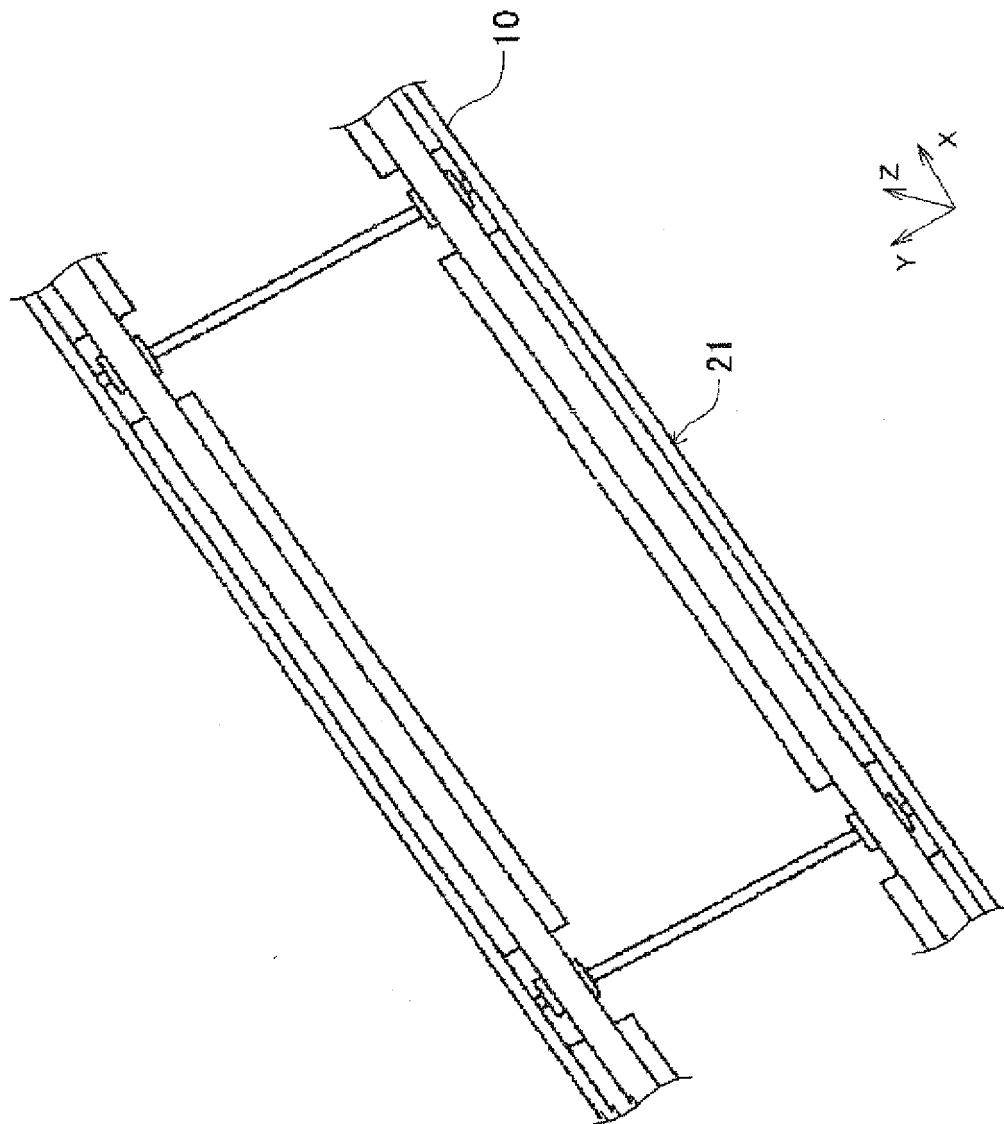


FIG. 8

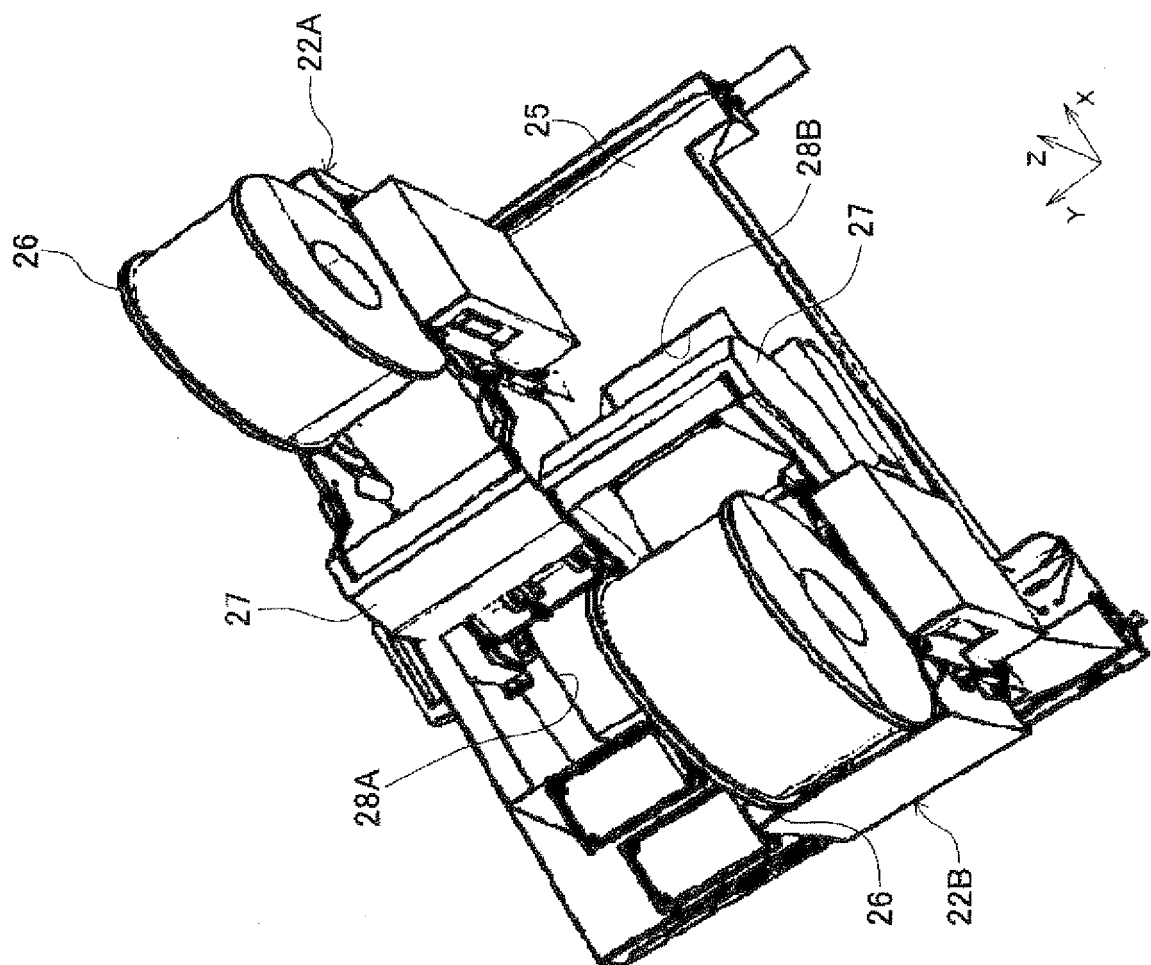


FIG. 9

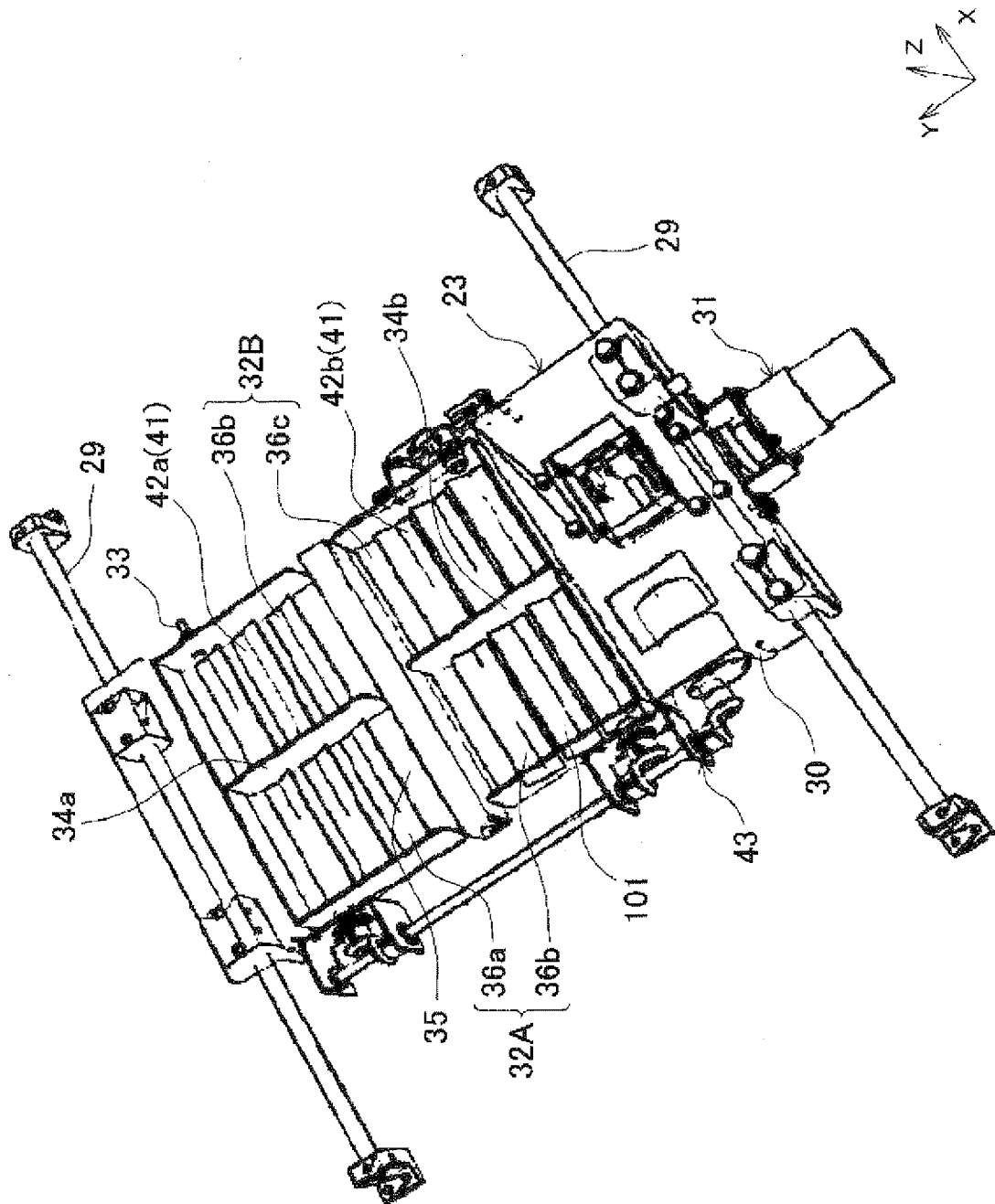


FIG. 10

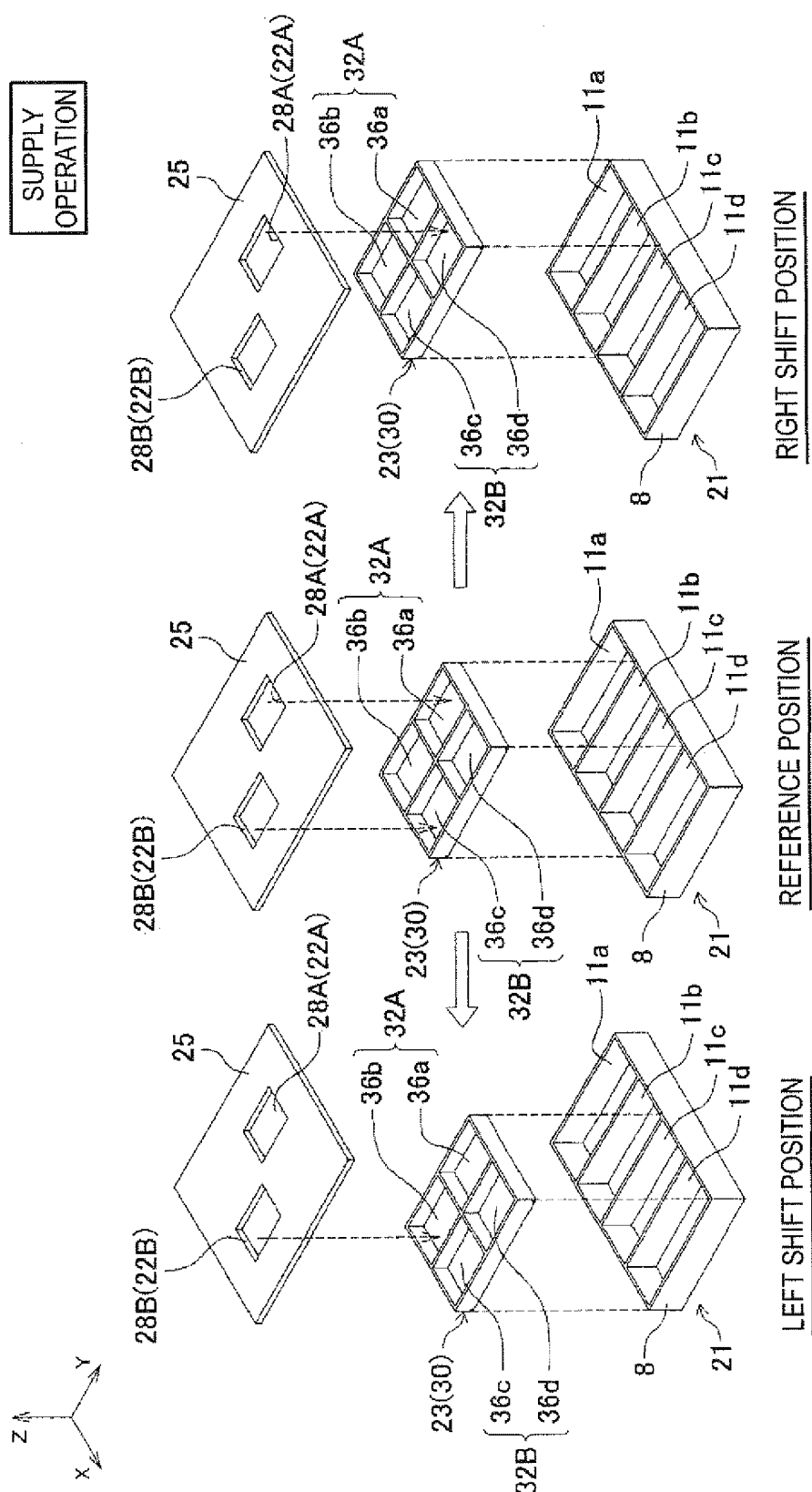


FIG. 11

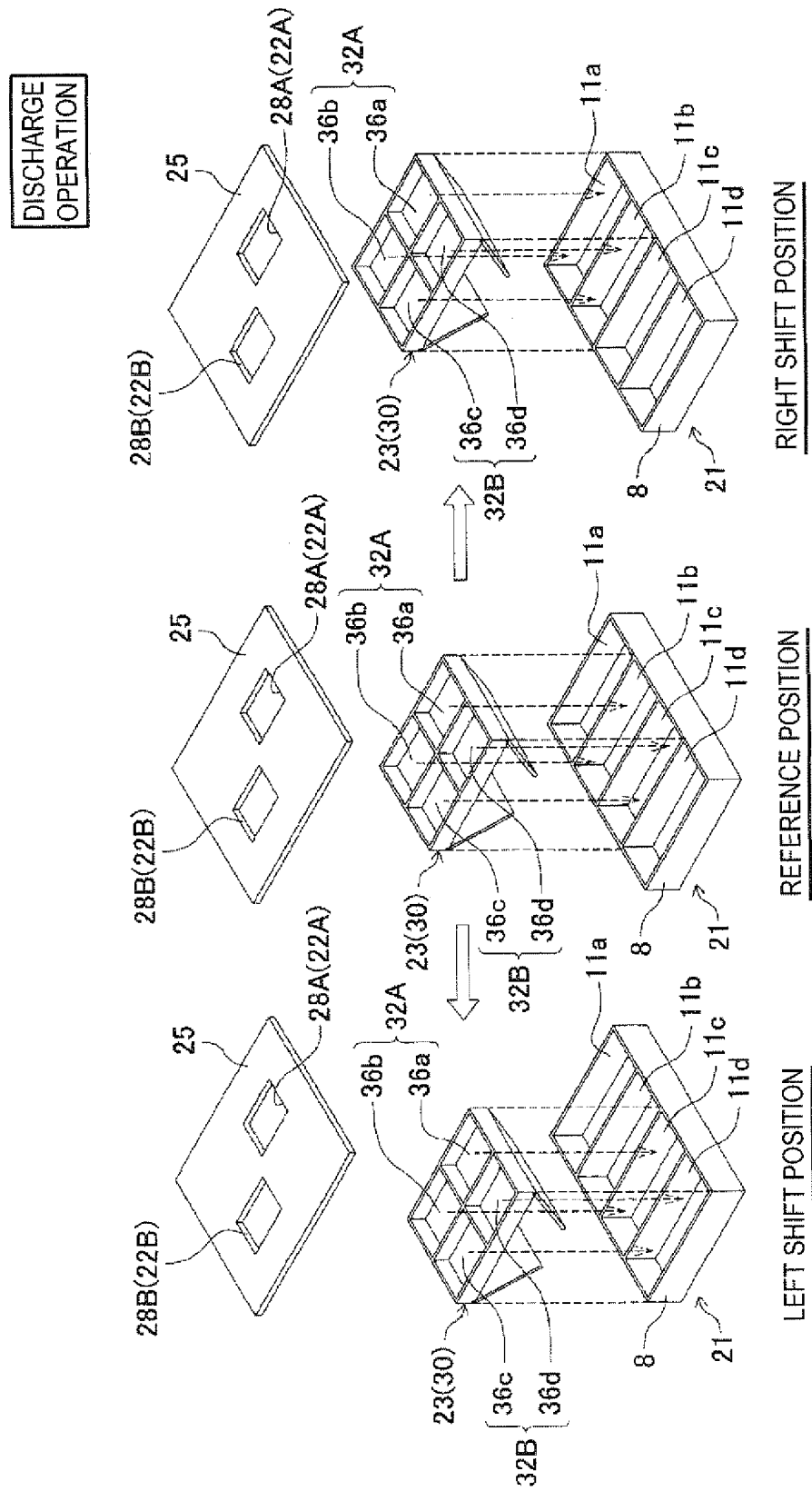


FIG. 12A

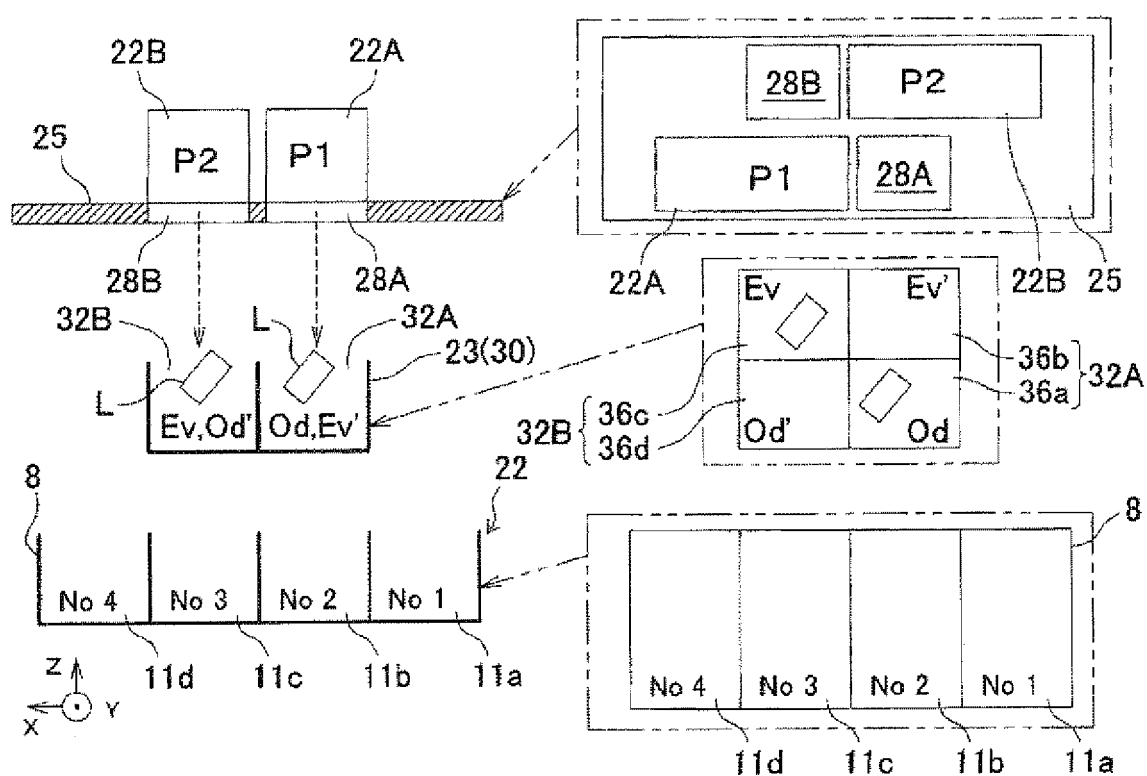


FIG. 12B

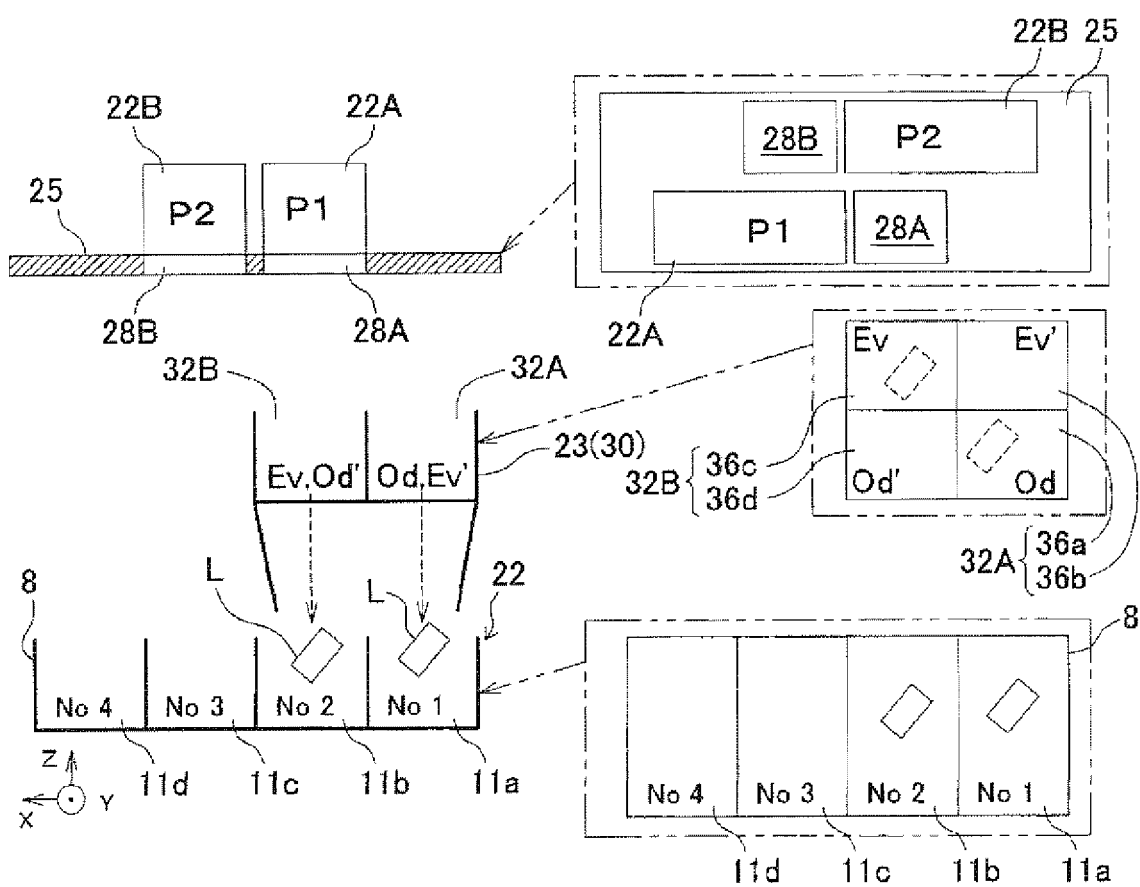


FIG. 12C

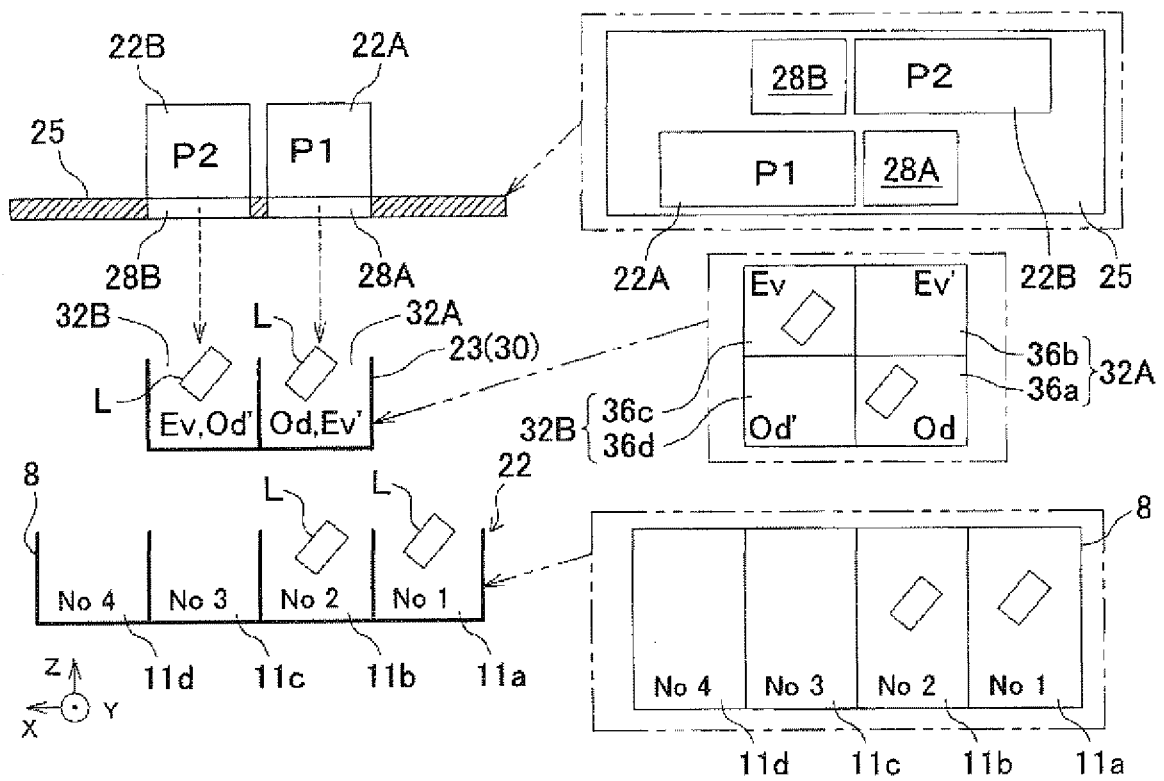


FIG. 12D

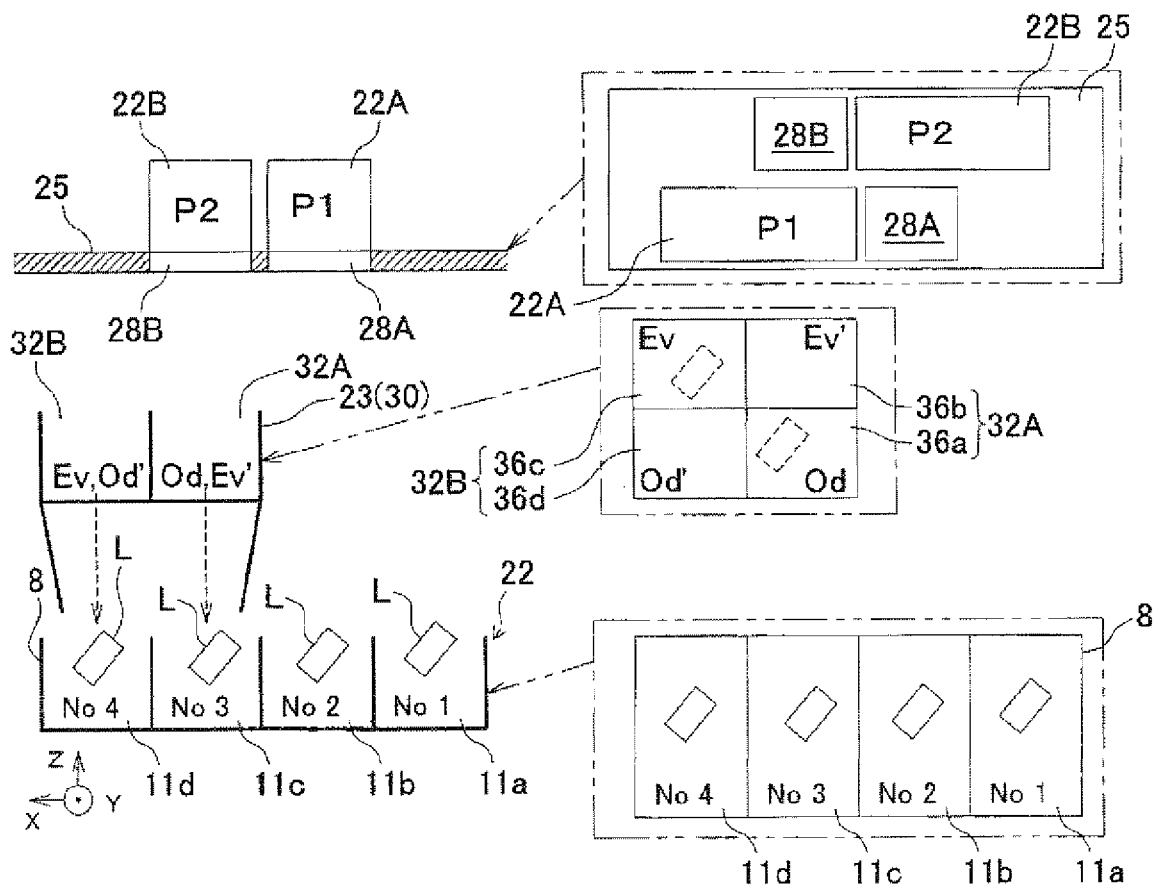


FIG. 13A

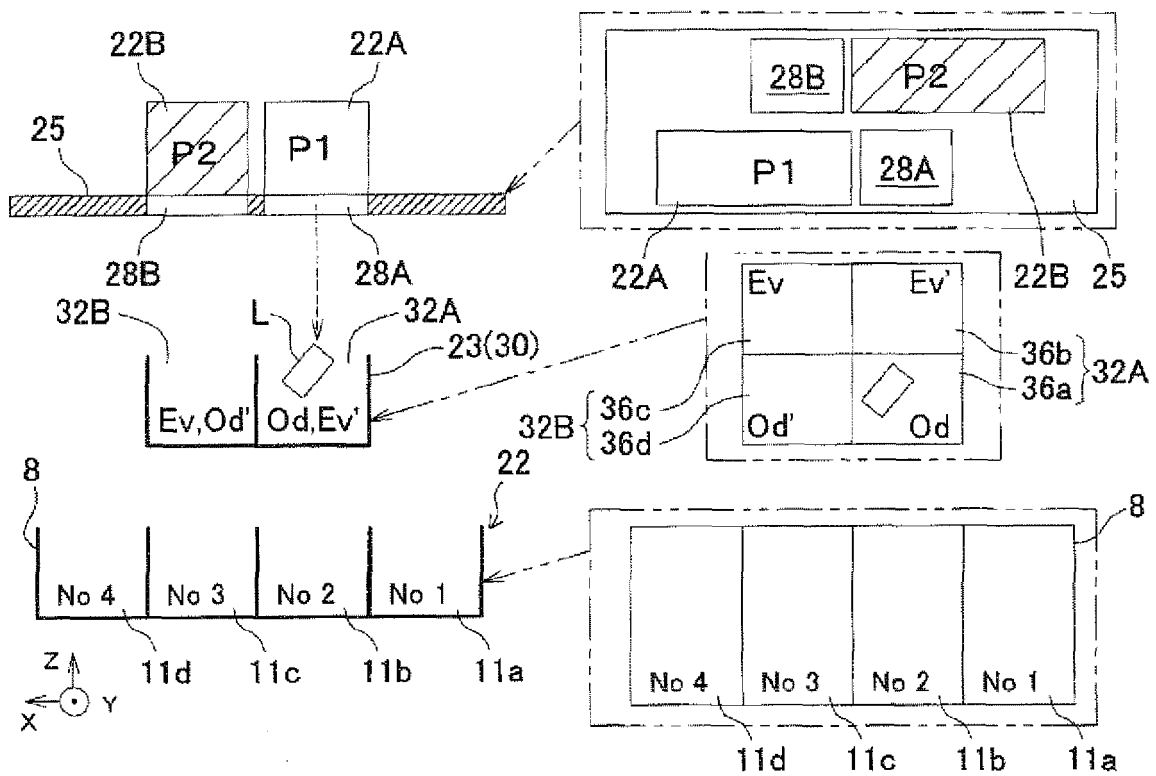


FIG. 13B

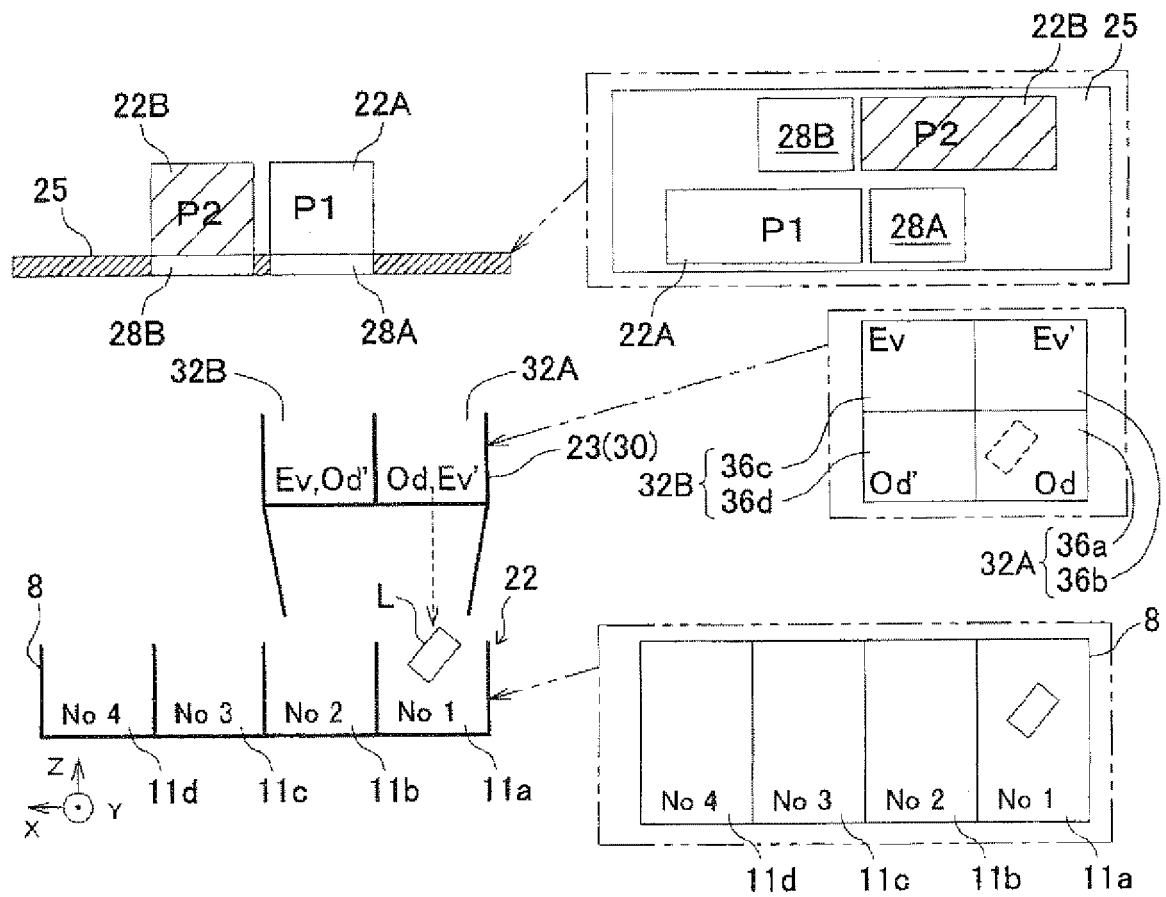


FIG. 13C

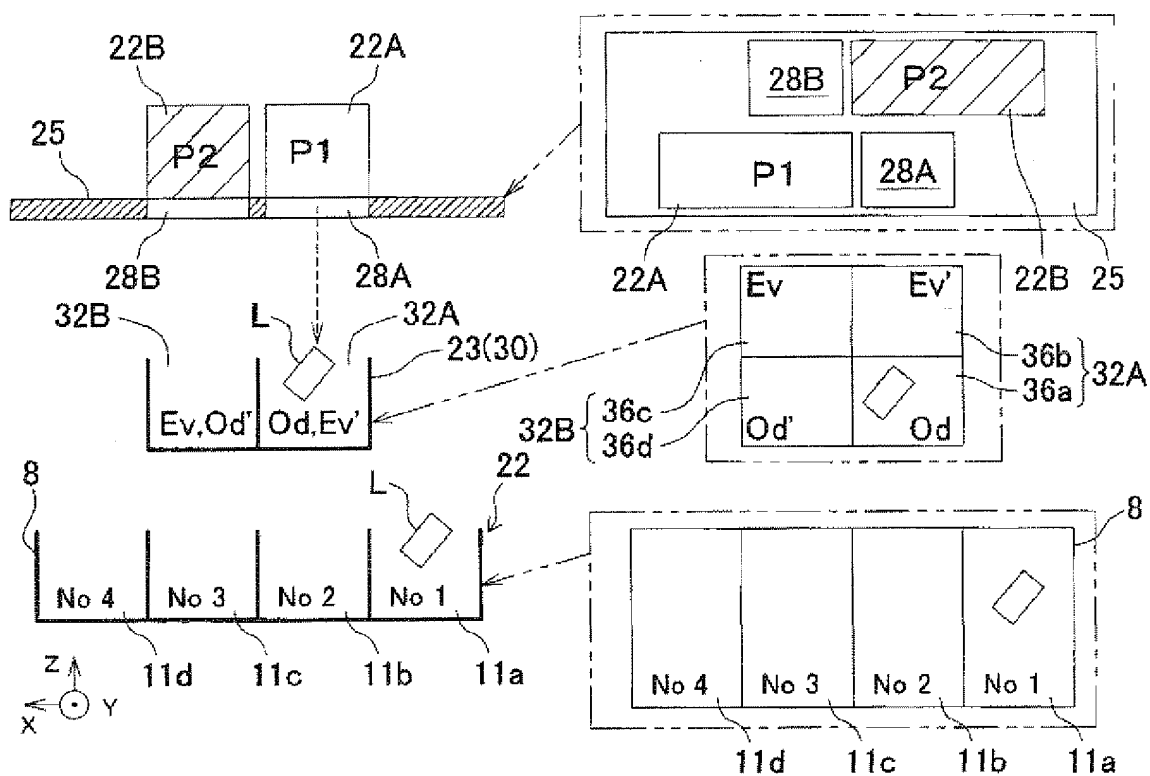


FIG. 13D

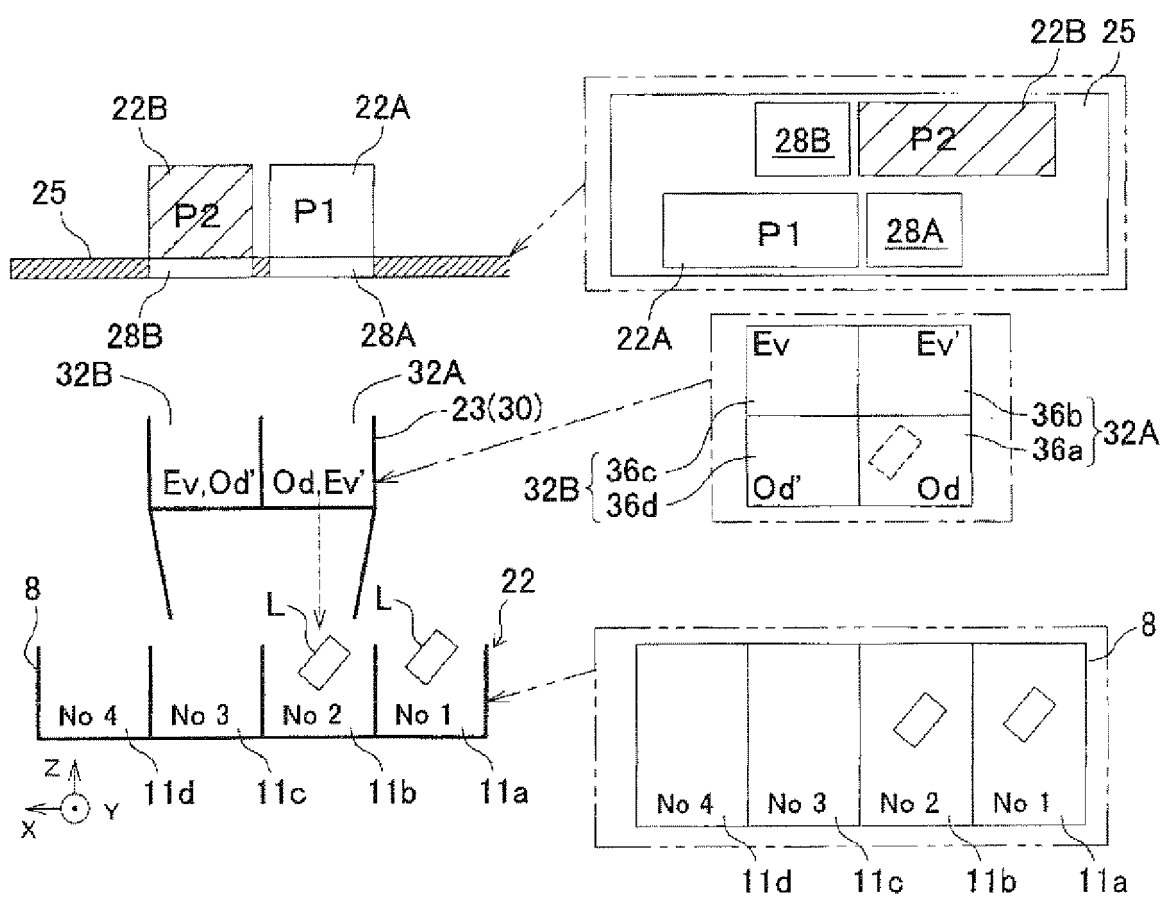


FIG. 13E

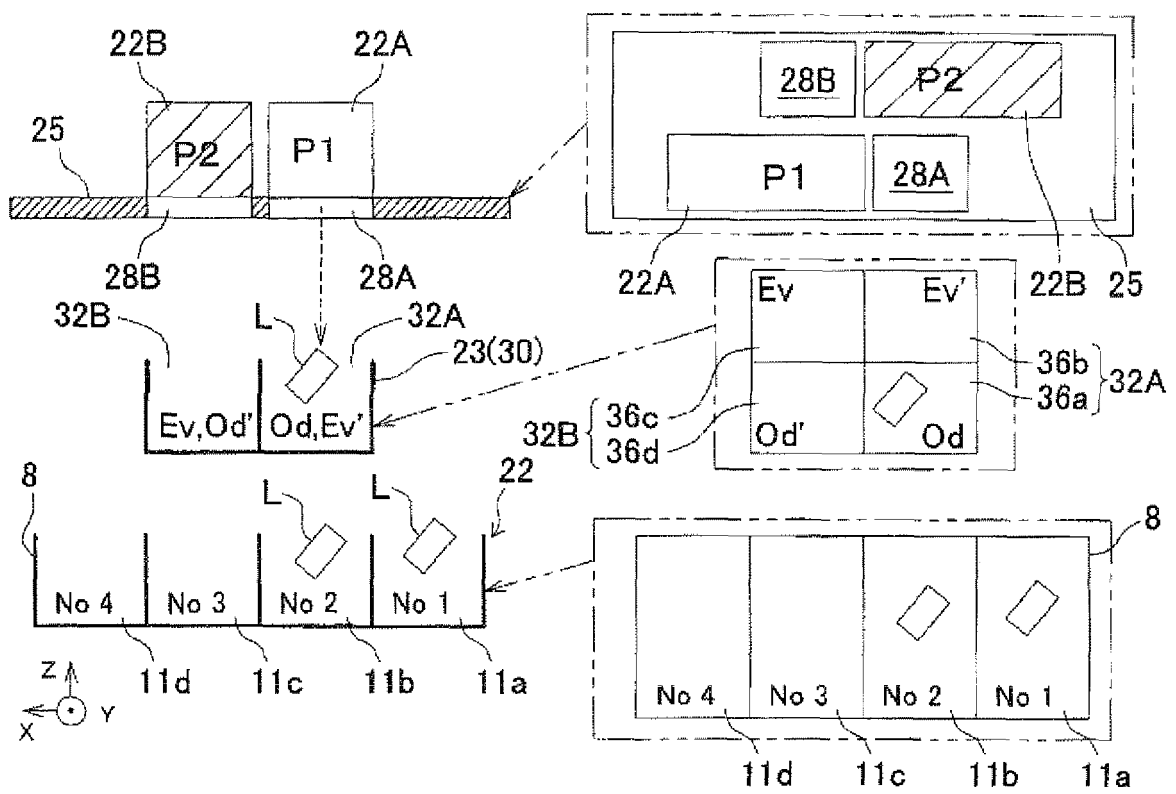


FIG. 13F

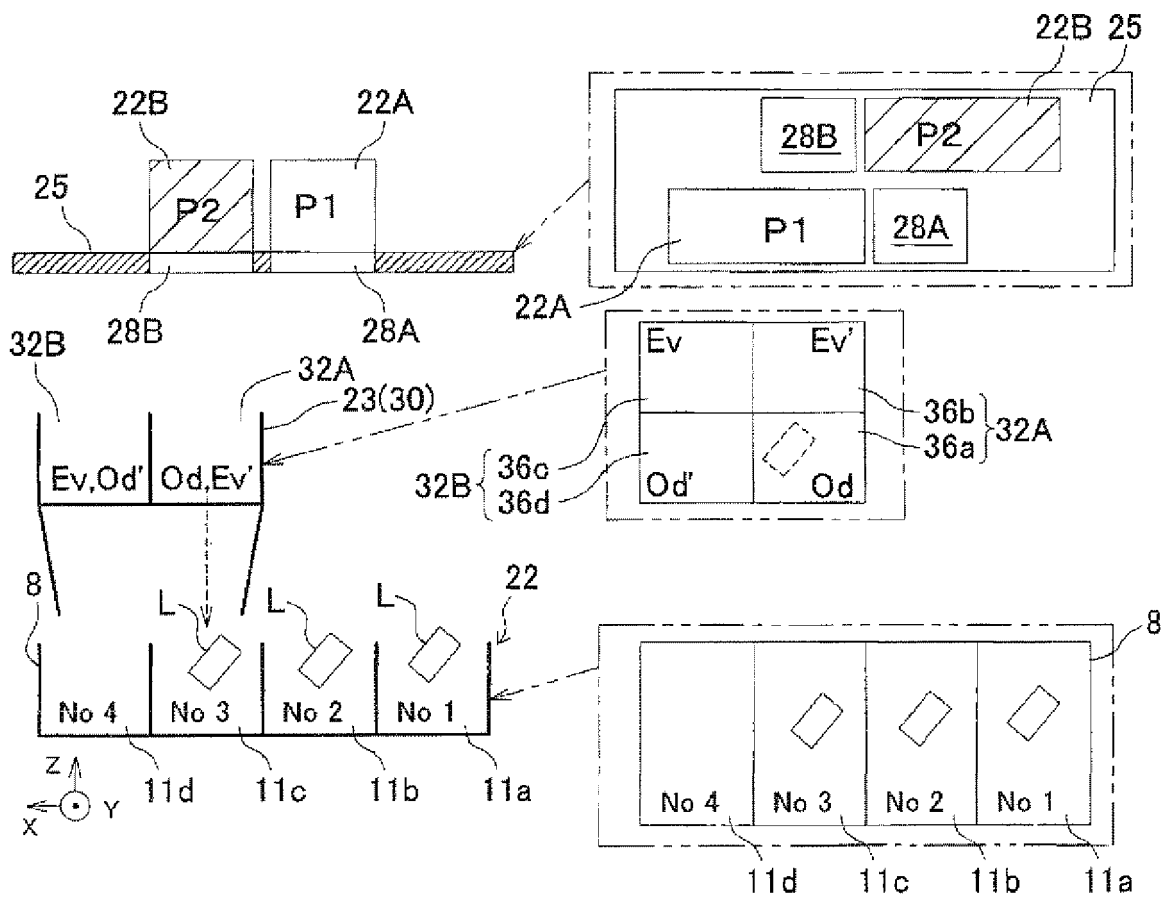


FIG. 13G

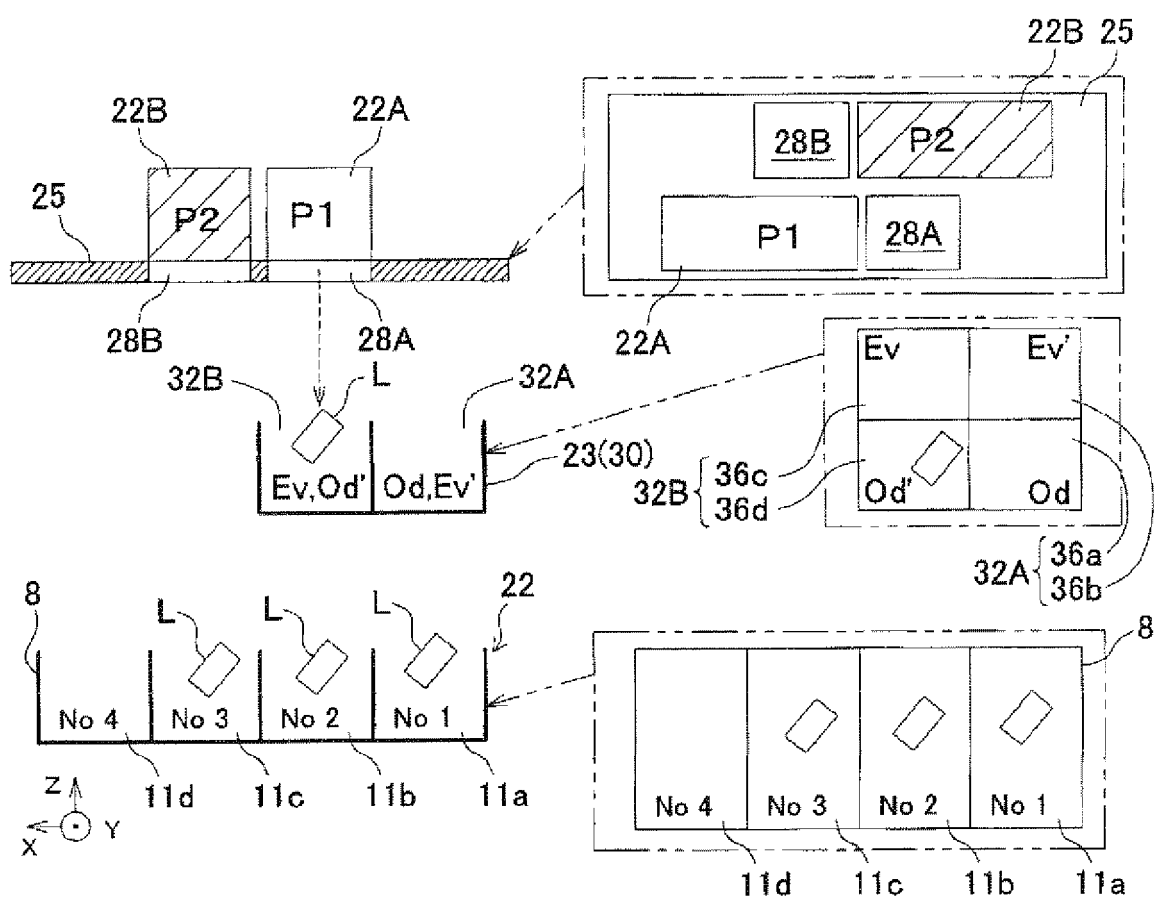


FIG. 13H

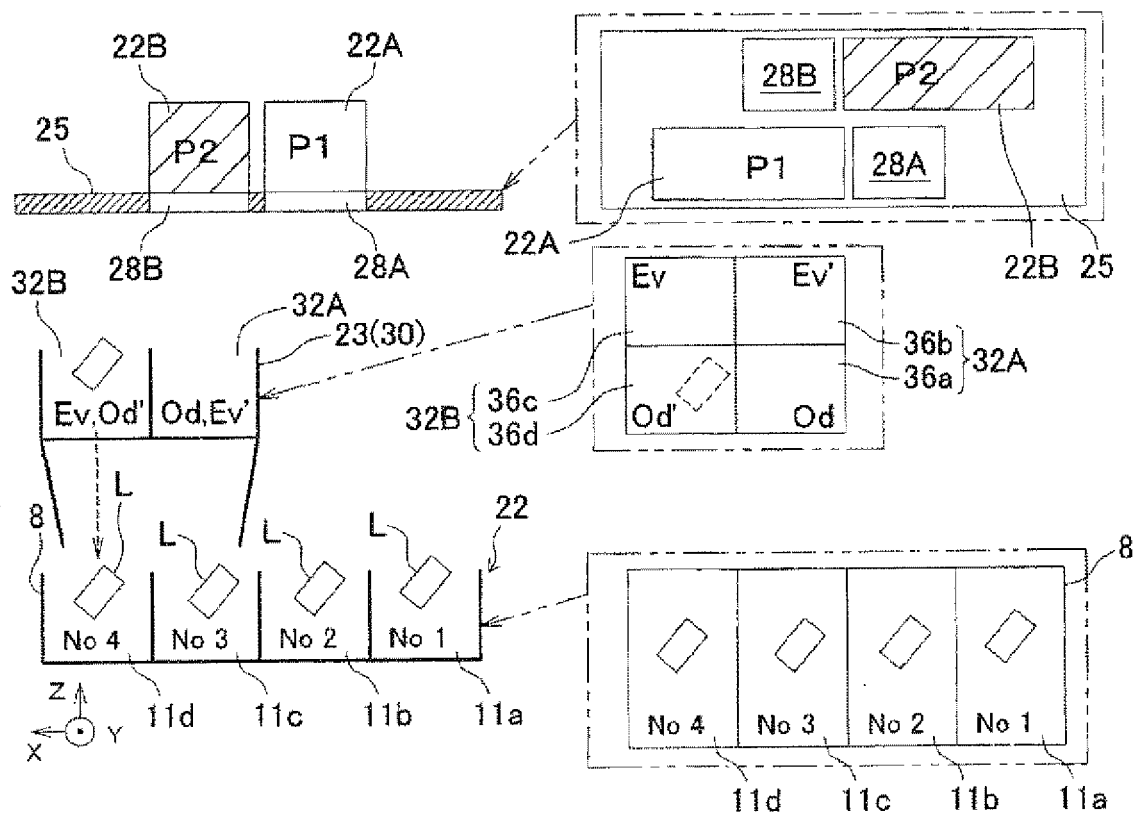


FIG. 14A

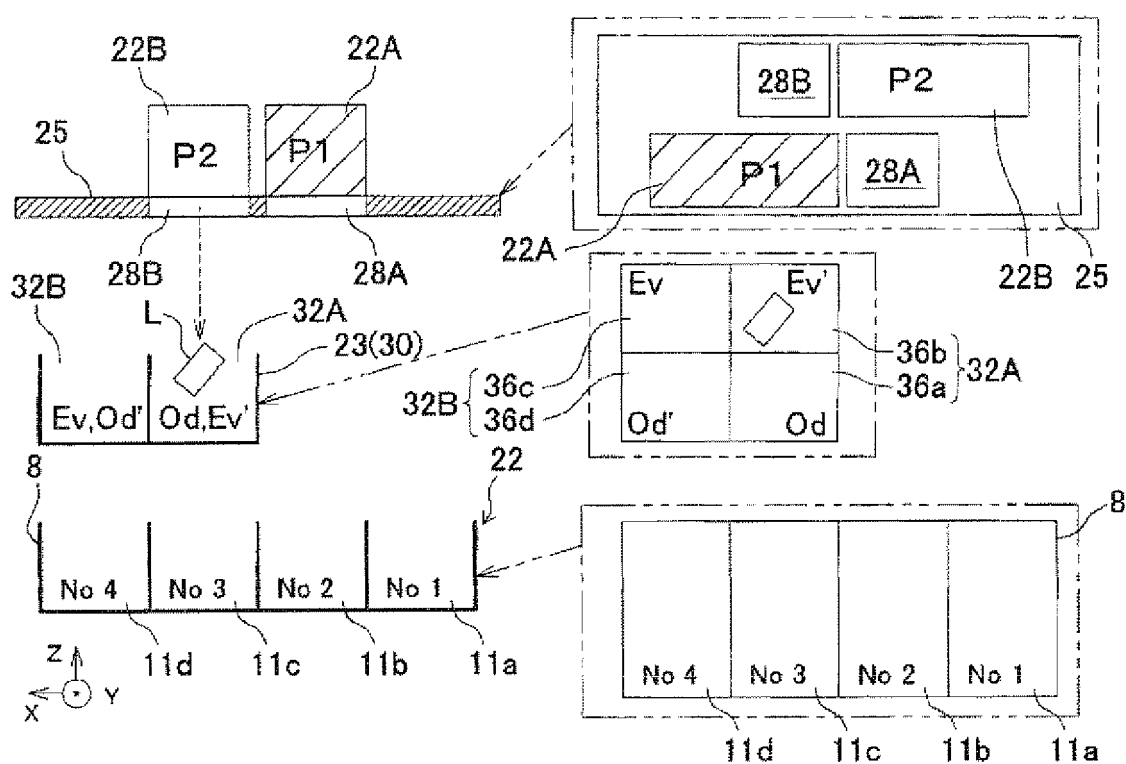


FIG. 14B

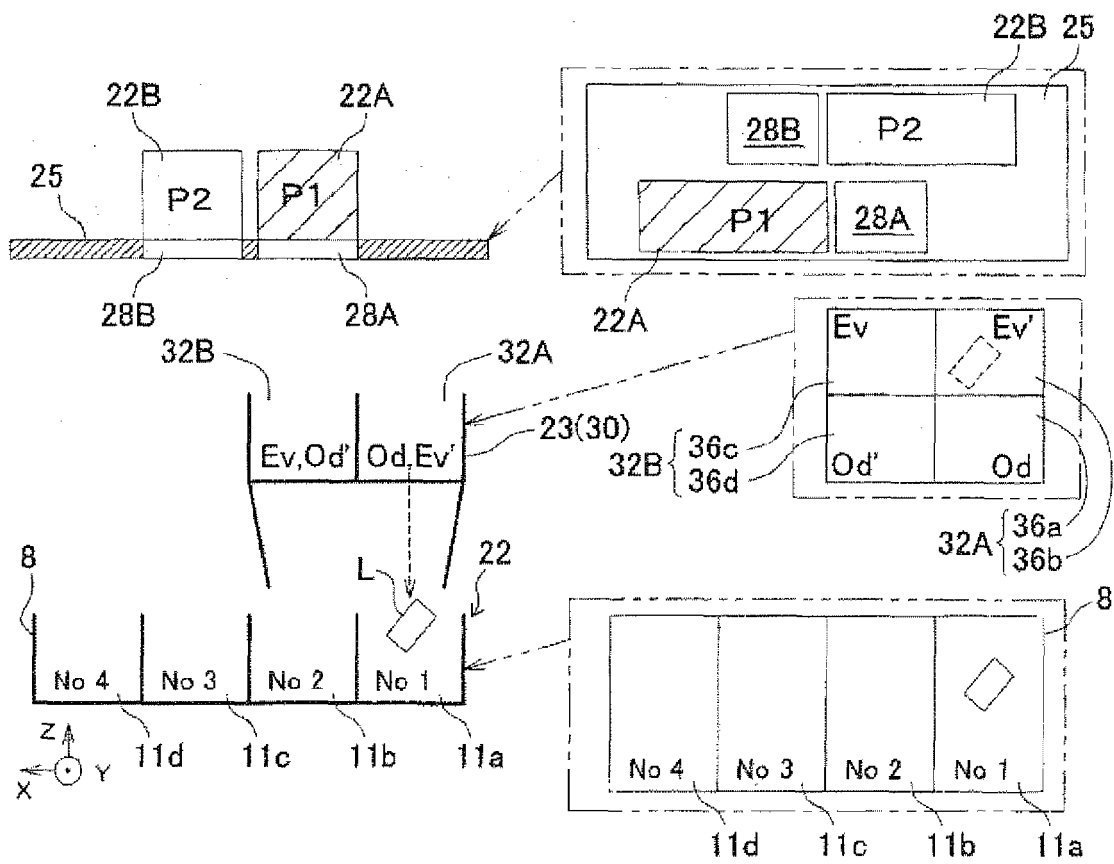


FIG. 14C

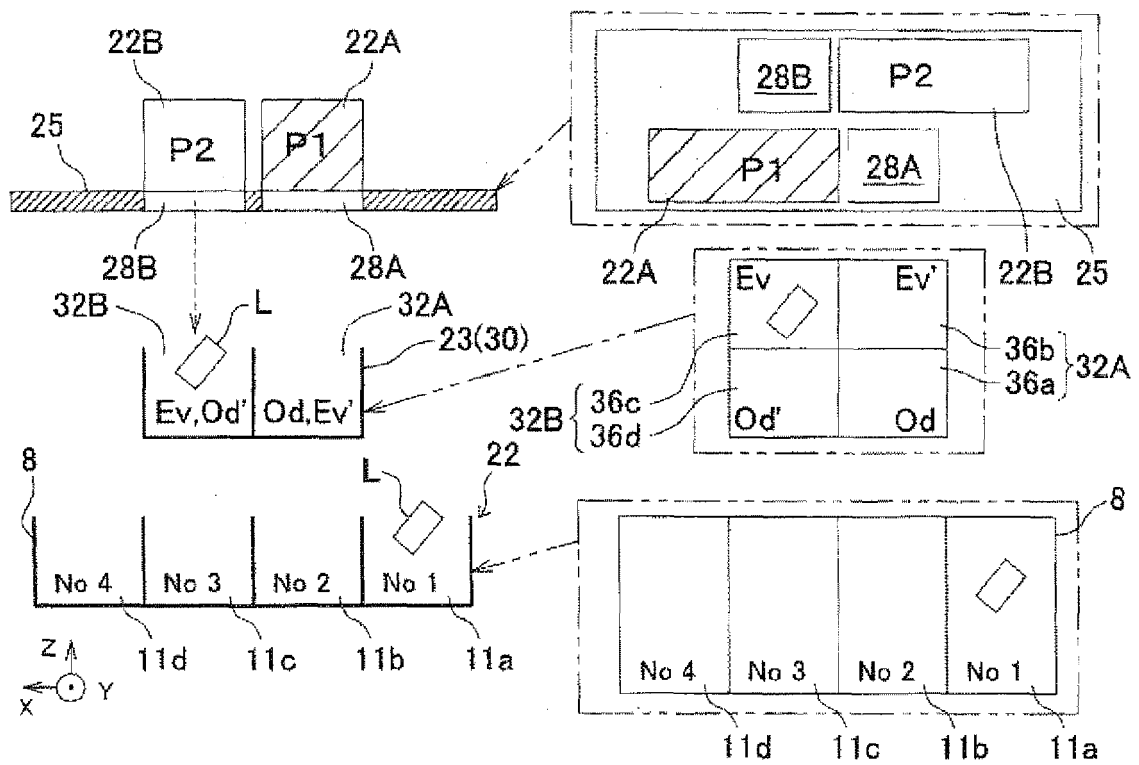


FIG. 14D

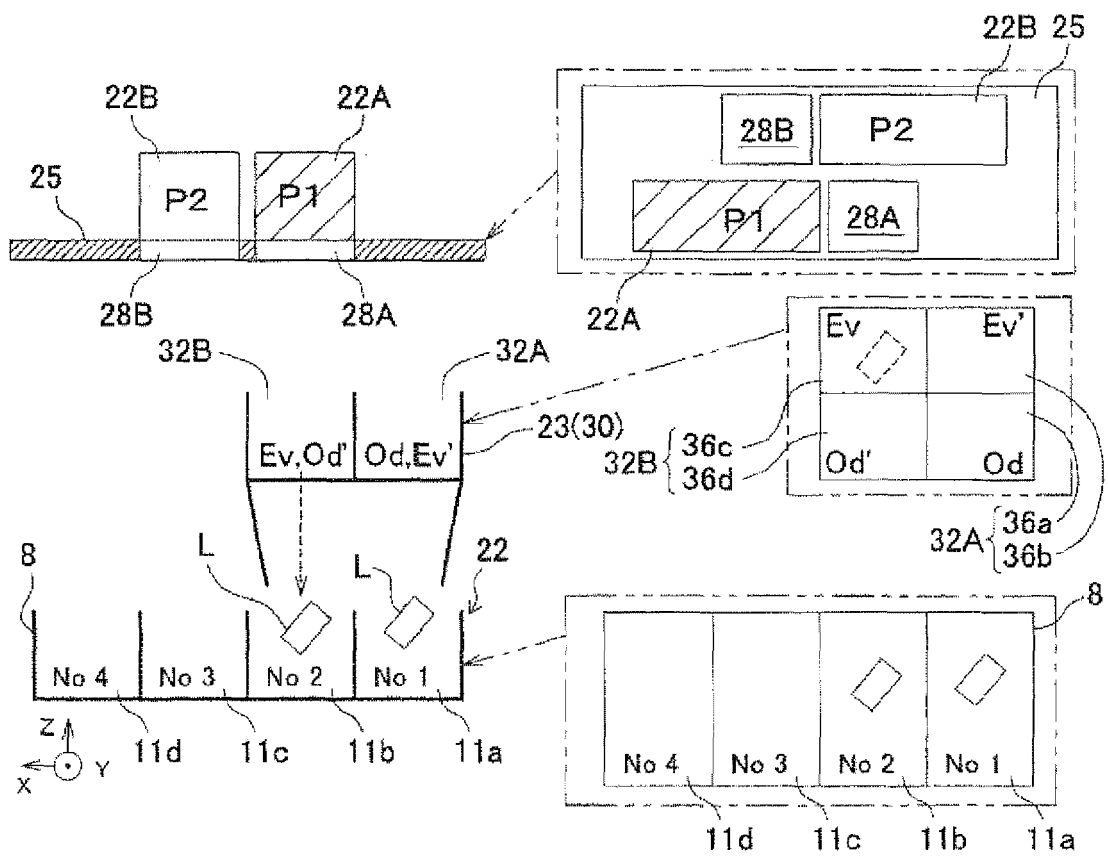


FIG. 14E

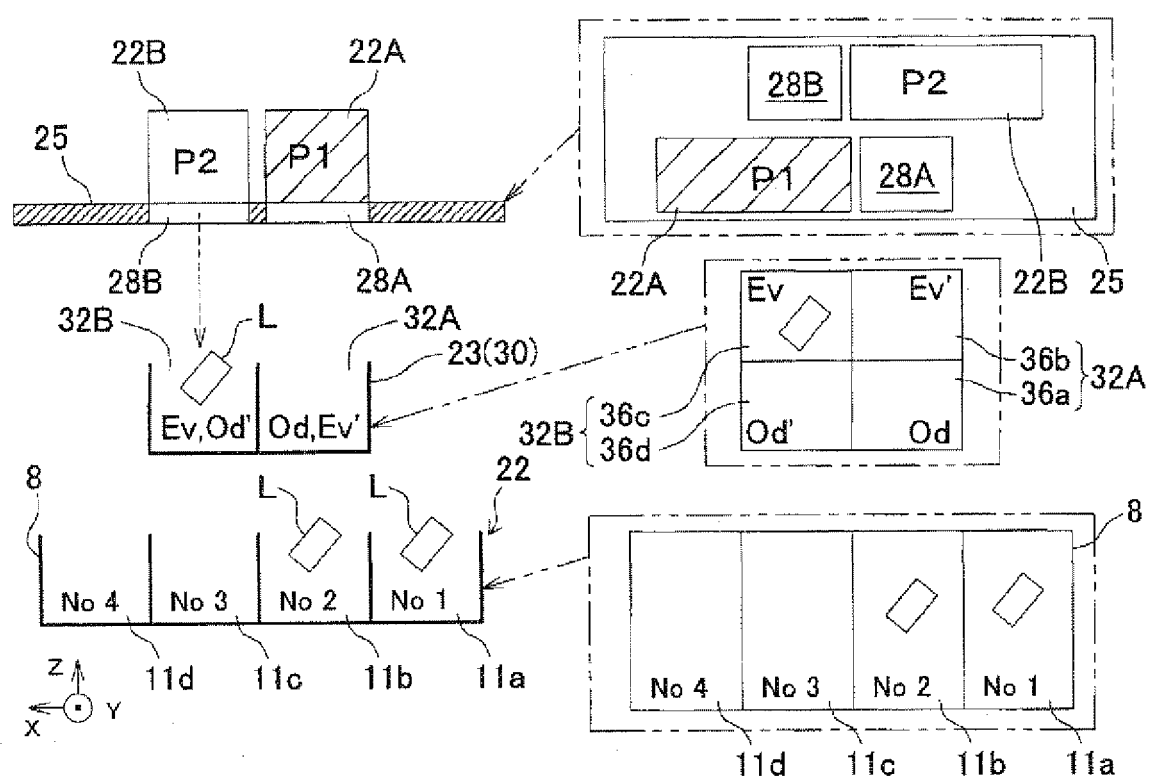


FIG. 14F

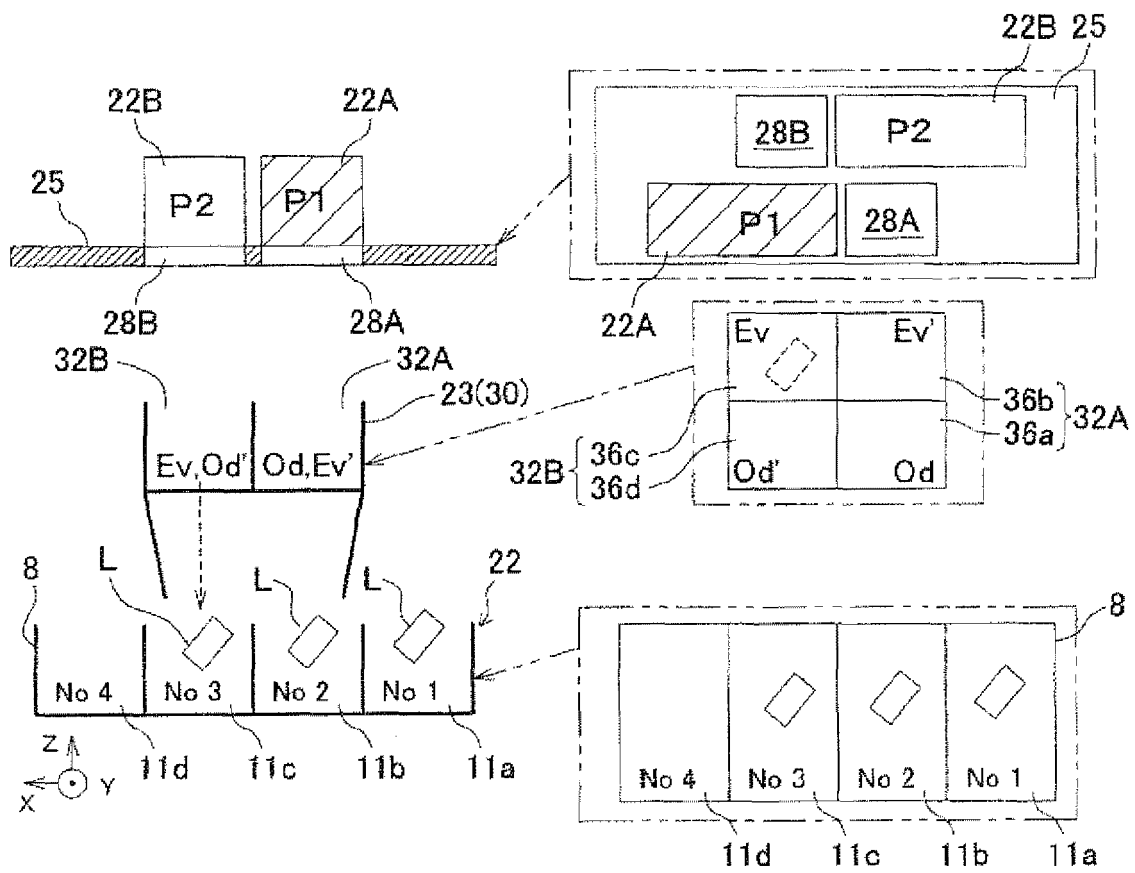


FIG. 14G

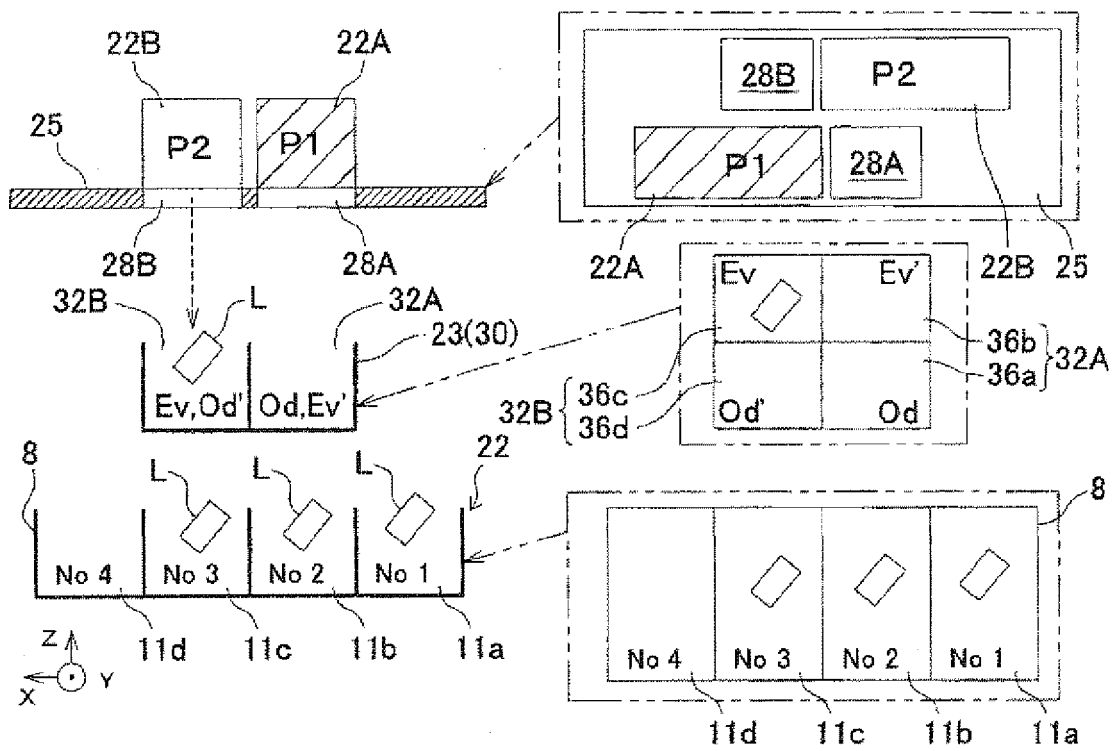


FIG. 14H

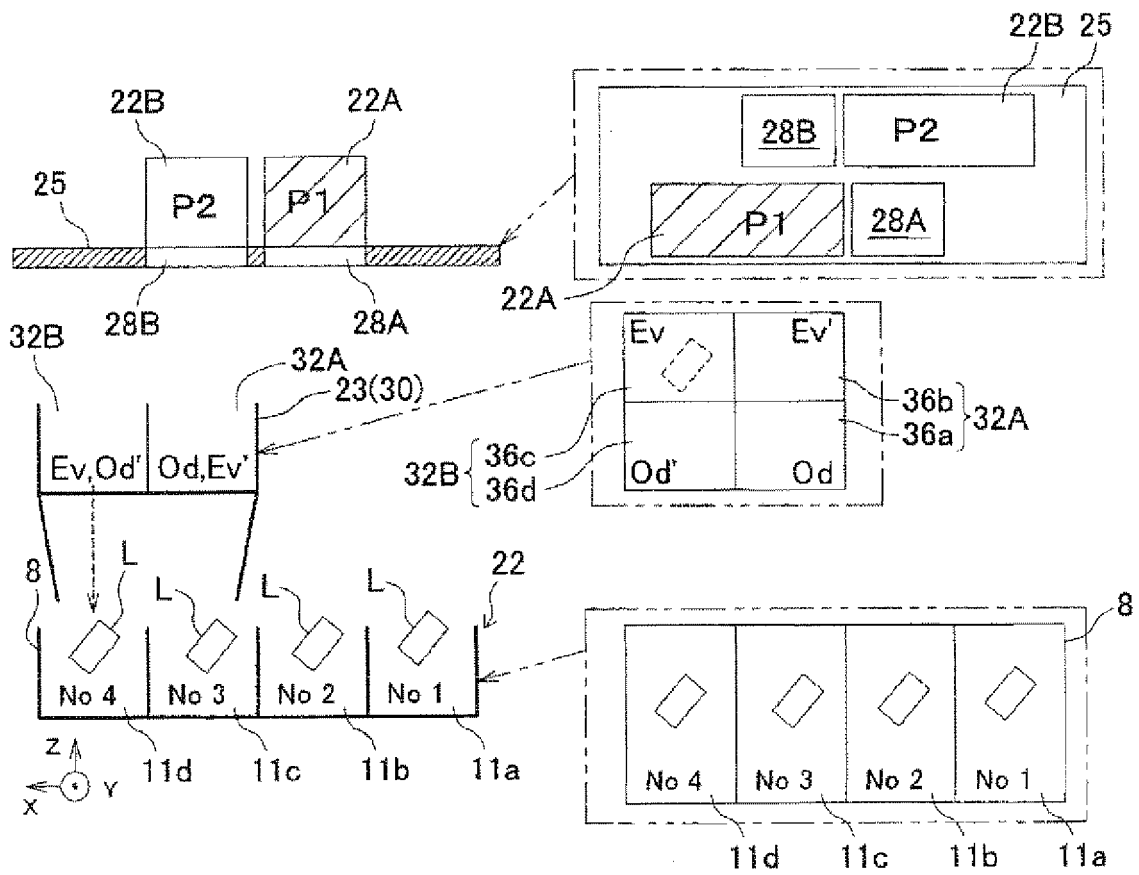


FIG. 15

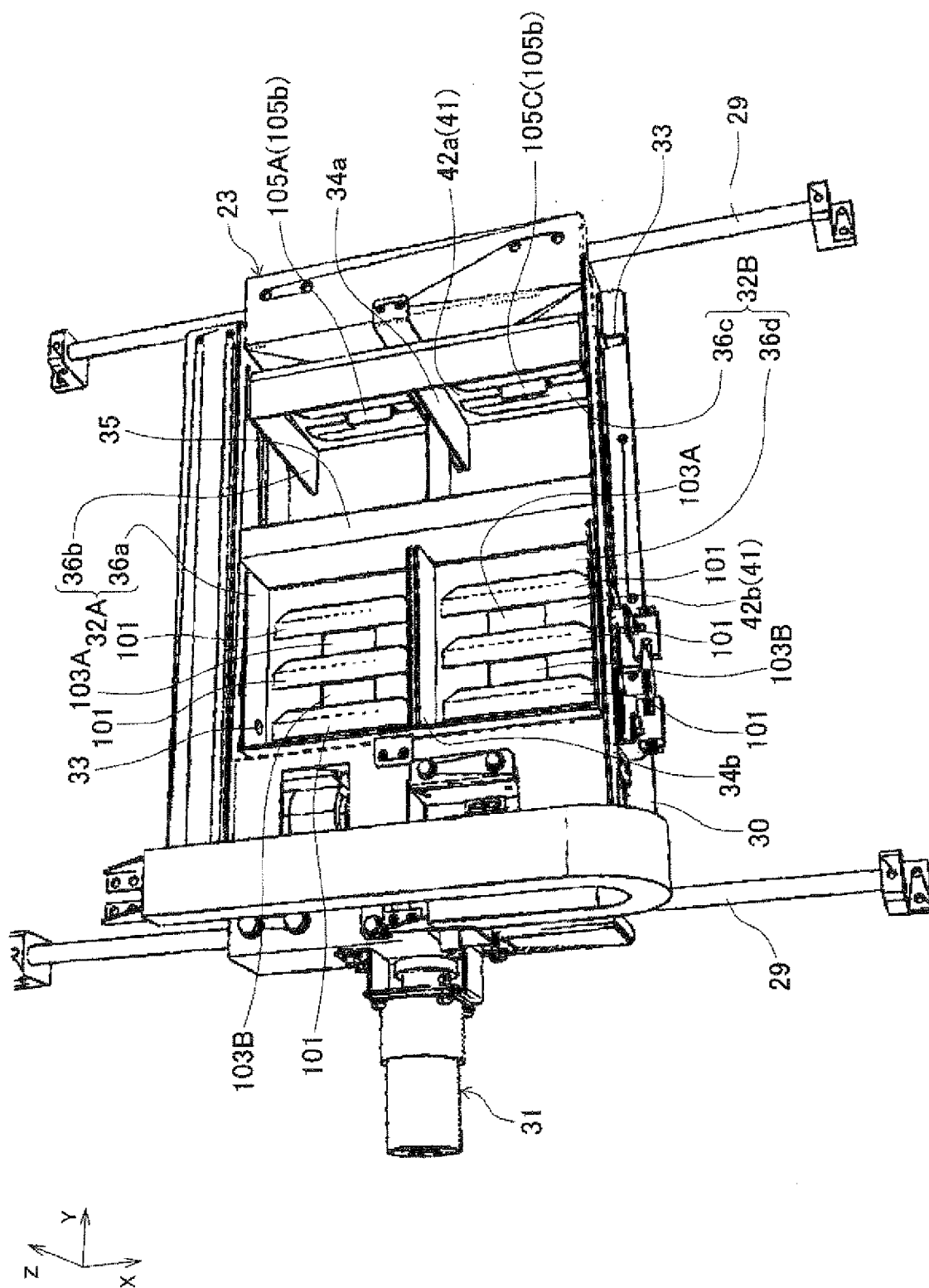


FIG. 16

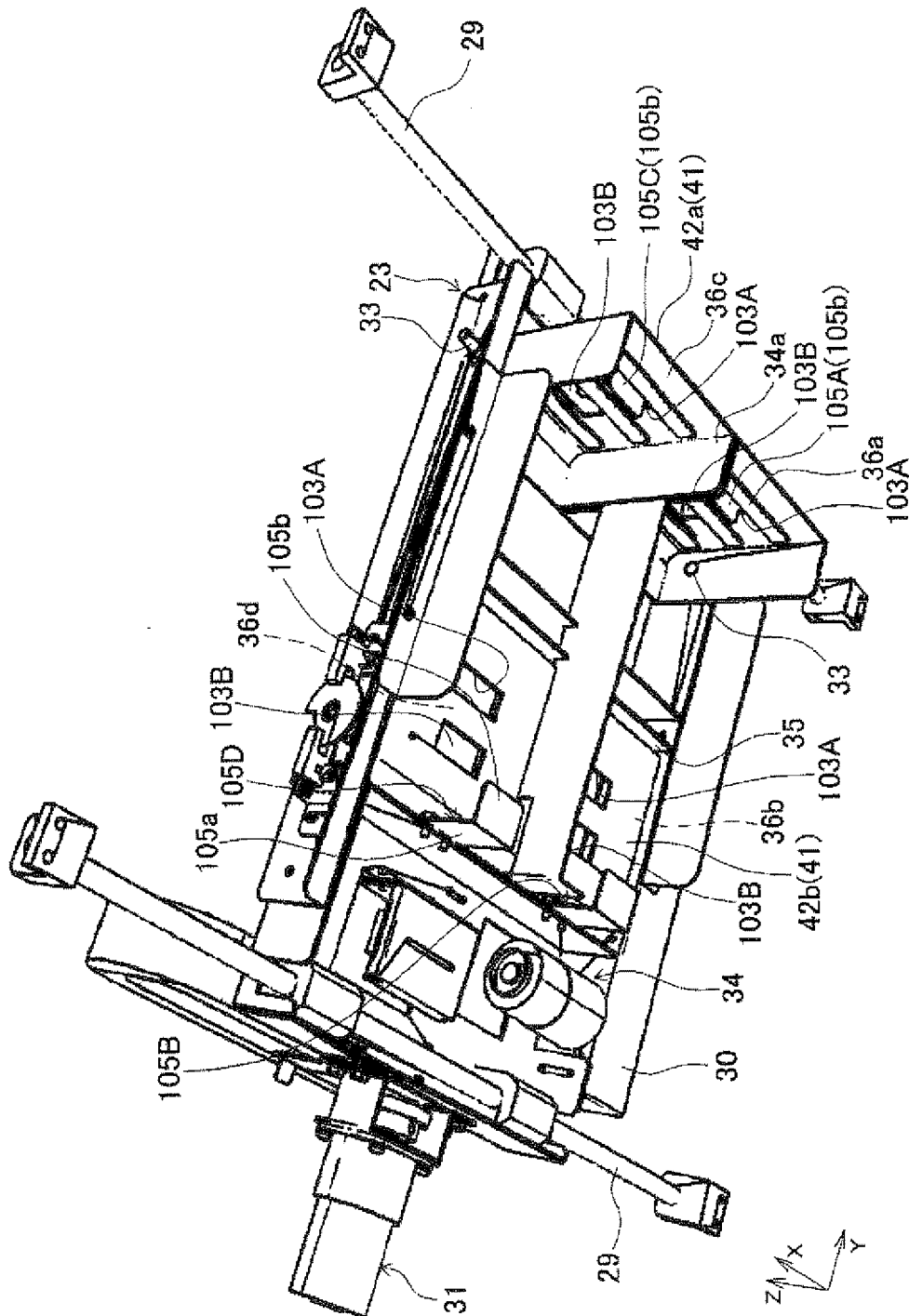


FIG. 17

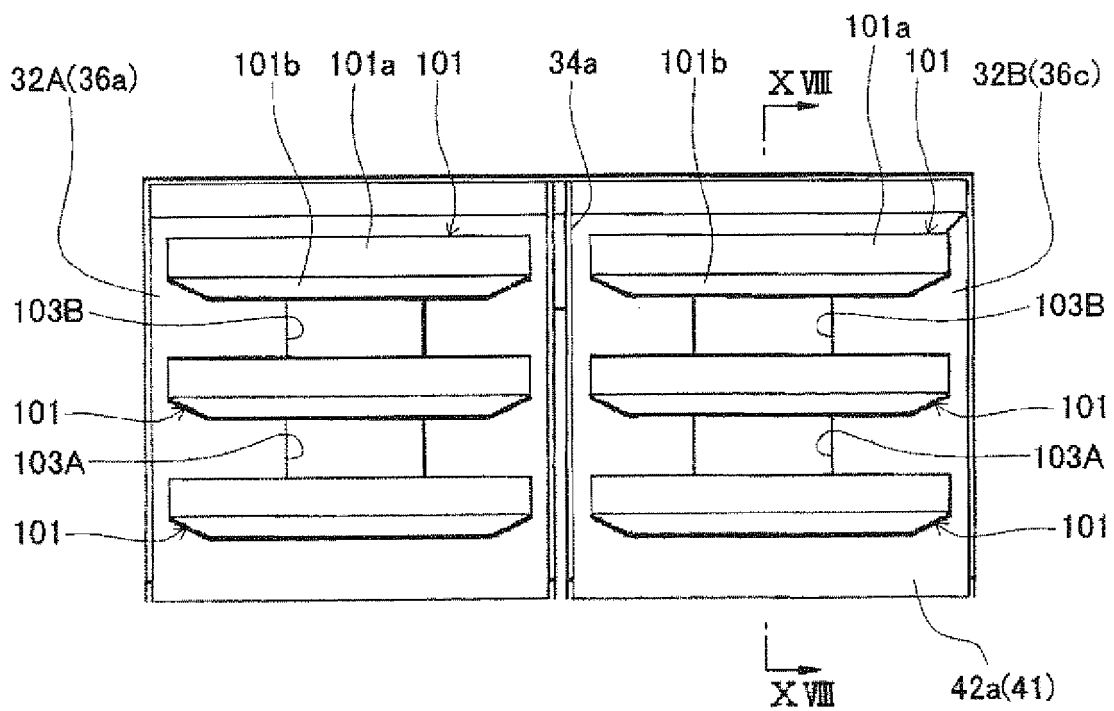
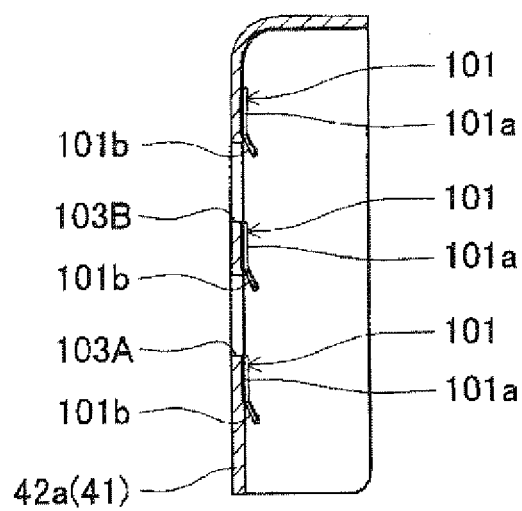


FIG. 18



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/051534

A. CLASSIFICATION OF SUBJECT MATTER <i>A61J3/00</i> (2006.01) i, <i>A61J1/14</i> (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) <i>A61J3/00</i> , <i>A61J1/14</i> 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 1996-2010 Kokai Jitsuyo Shinan Koho 1971-2010 Toroku Jitsuyo Shinan Koho 1994-2010 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.
Y	JP 2007-117708 A (Yuyama Mfg. Co., Ltd.), 17 May 2007 (17.05.2007), paragraphs [0001], [0014] to [0018], [0046] to [0049], [0077] to [0081]; fig. 1, 6, 12, 13 & EP 1929991 A1 & WO 2007/040092 A1	1-3
Y	JP 2006-109899 A (Matsushita Electric Industrial Co., Ltd.), 27 April 2006 (27.04.2006), paragraphs [0001], [0028], [0029]; fig. 4, 8 (Family: none)	1-3
Y	JP 7-267344 A (Nichiro Kogyo Co., Ltd.), 17 October 1995 (17.10.1995), paragraph [0012]; fig. 1 (Family: none)	1-3
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
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Date of the actual completion of the international search 28 April, 2010 (28.04.10)		Date of mailing of the international search report 18 May, 2010 (18.05.10)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

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- JP 2006109899 A [0003]
- JP 2002165865 A [0027]
- JP 2002240946 A [0028]
- JP 2005105629 A [0029]