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(54) **PARTITION PLATE FOR USE IN V-MEASURE OF MEDICINE PACKING DEVICE**

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(57) **ABSTRACT**

There is provided a partition plate for use in a V-shaped measure of a medicine packing device, which allows a medicine remaining in the V-shaped measure to be easily cleaned and is smoothly reciprocated in the V-shaped measure. The partition plate 7 comprises: a slide member 8 including a guide receiving portion 11 and being attached so as to be reciprocated along a side plate 4; and a partition member 9 including a guide portion 18 removably guided by the guide receiving portion 11 of the slide member 8, the partition member being reciprocated in the V-shaped measure 1 while being maintained parallel to end plates 5. A grasping portion 8a for grasping the partition plate 7 is integrally provided in the slide member 8. Grasping the grasping portion 8a and moving the partition plate 7 prevent the partition plate 7 from flexing and smoothly moves the partition plate 7 in the V-shaped measure.

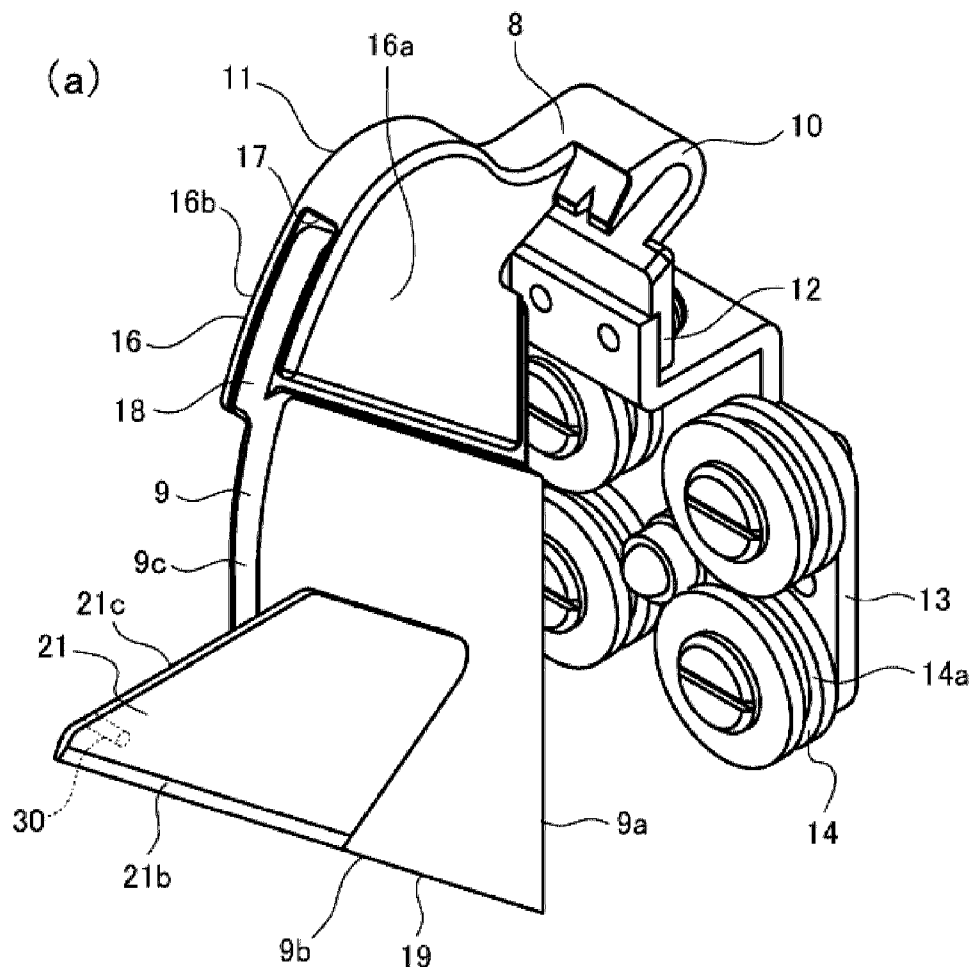
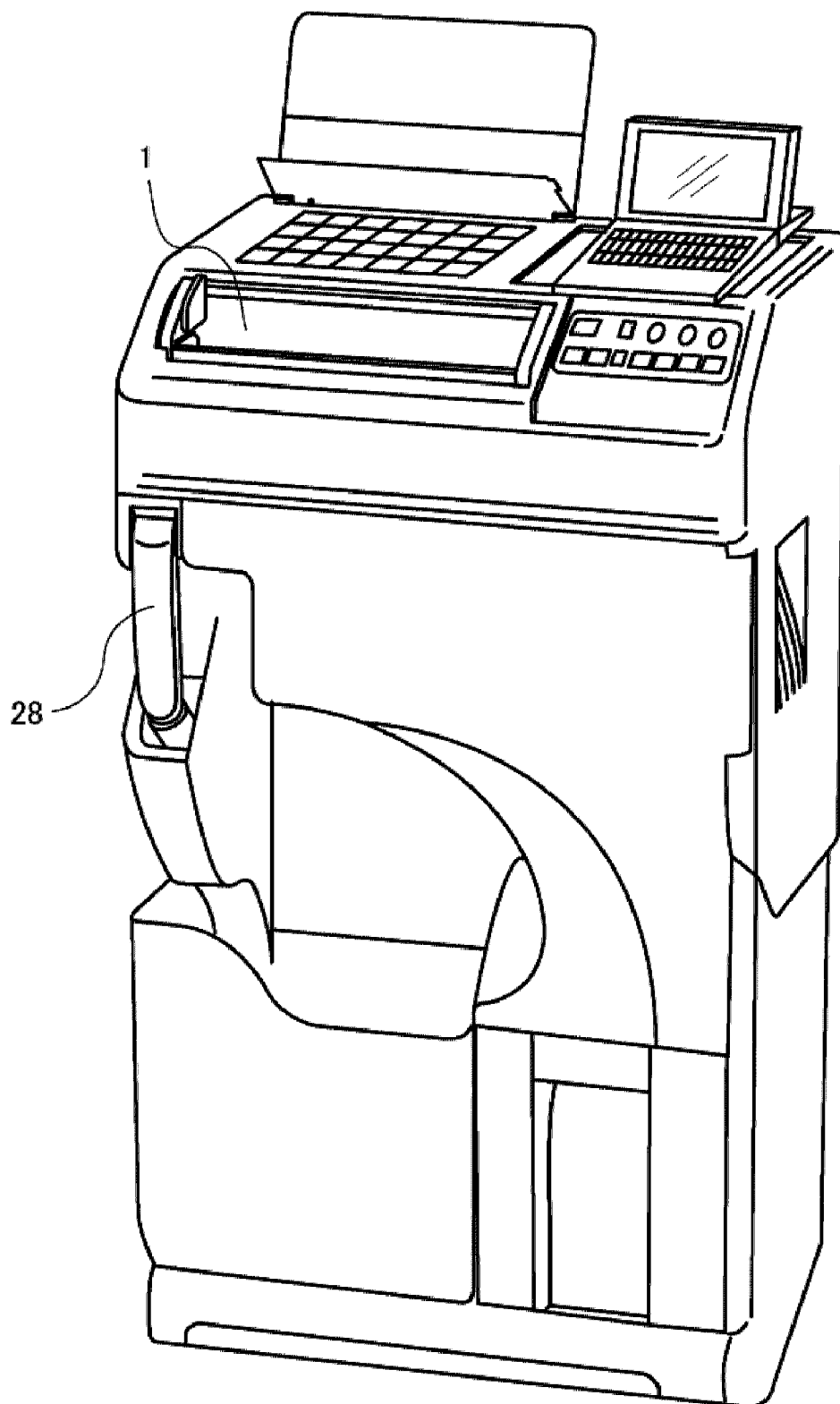


FIG. 1



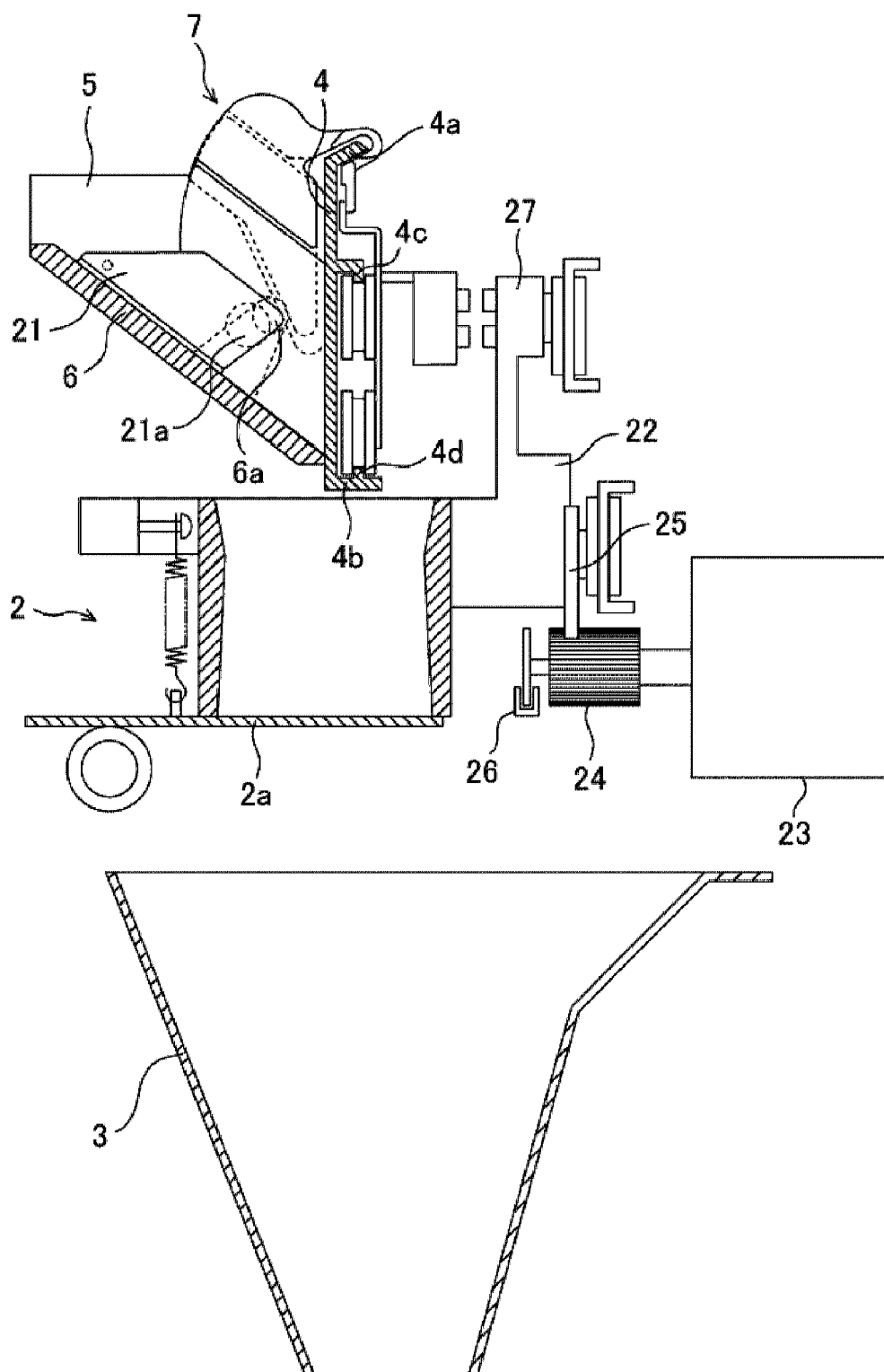


FIG. 3

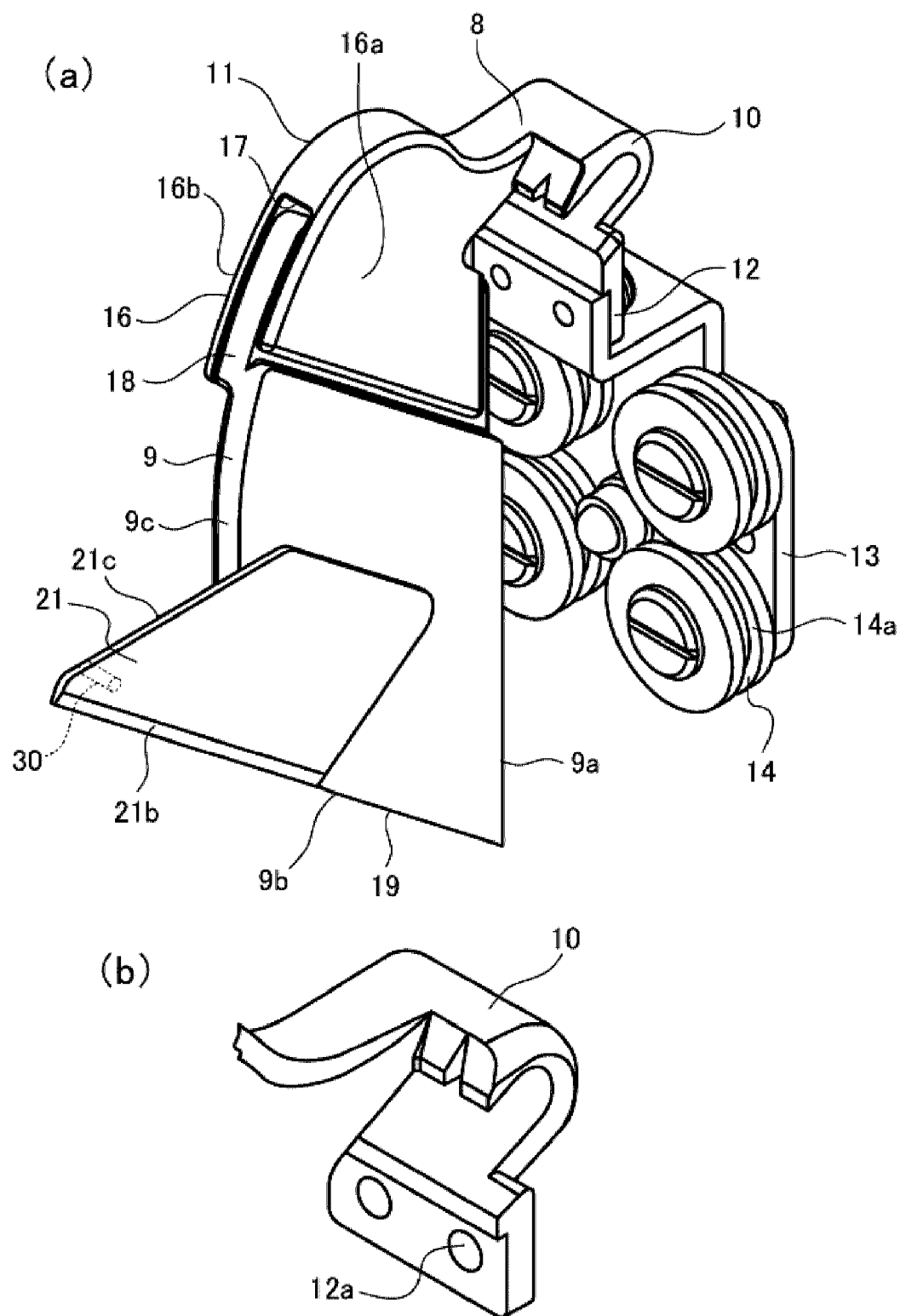


FIG. 4

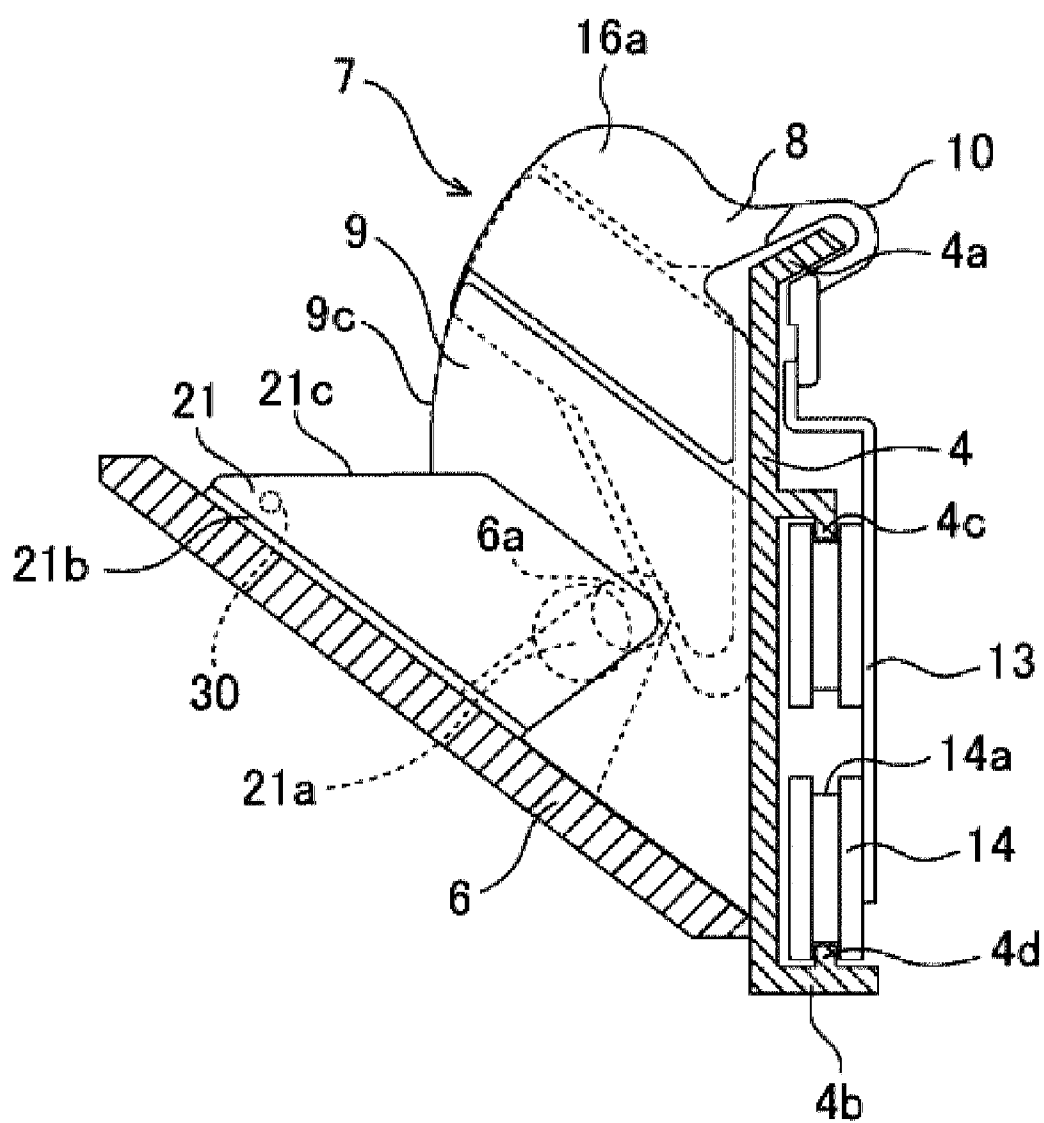
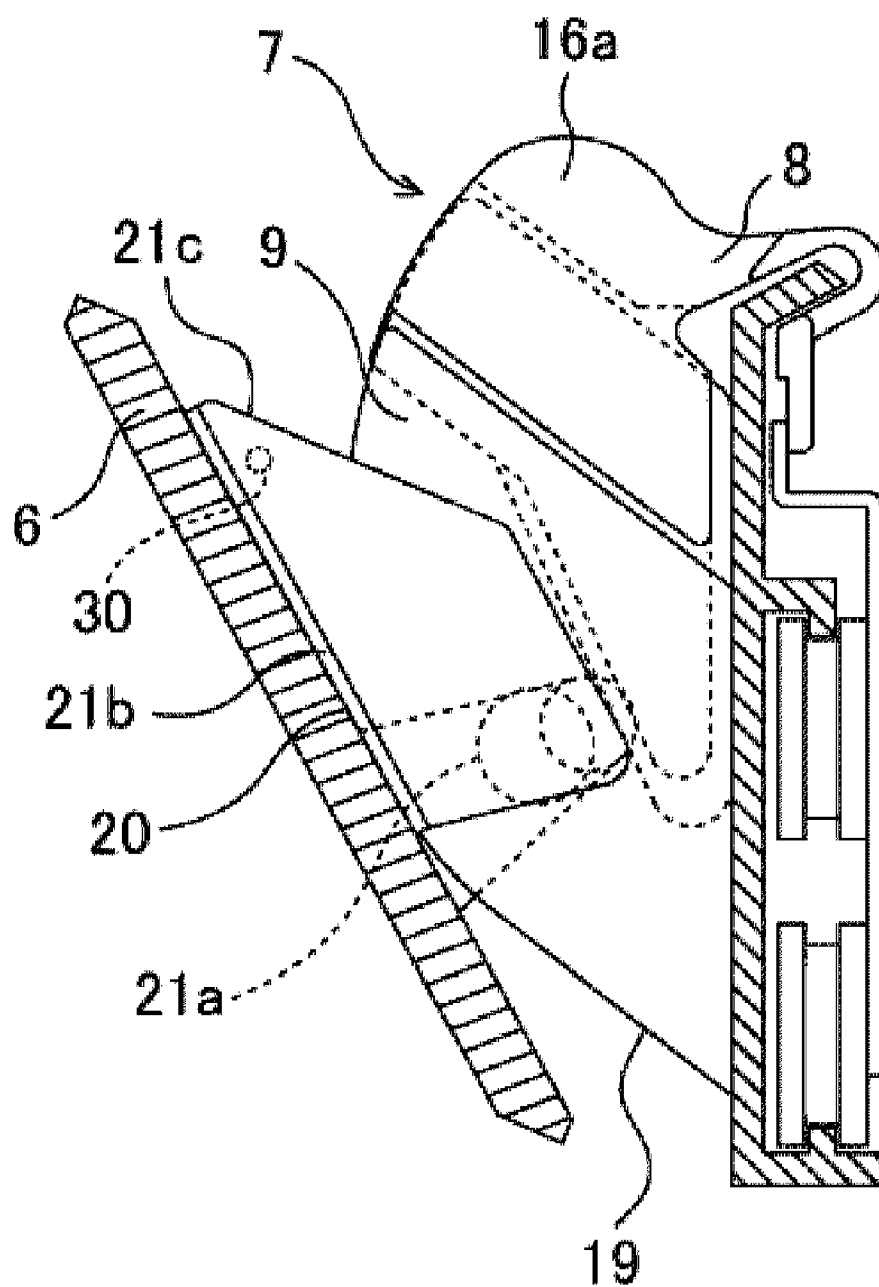


FIG. 5



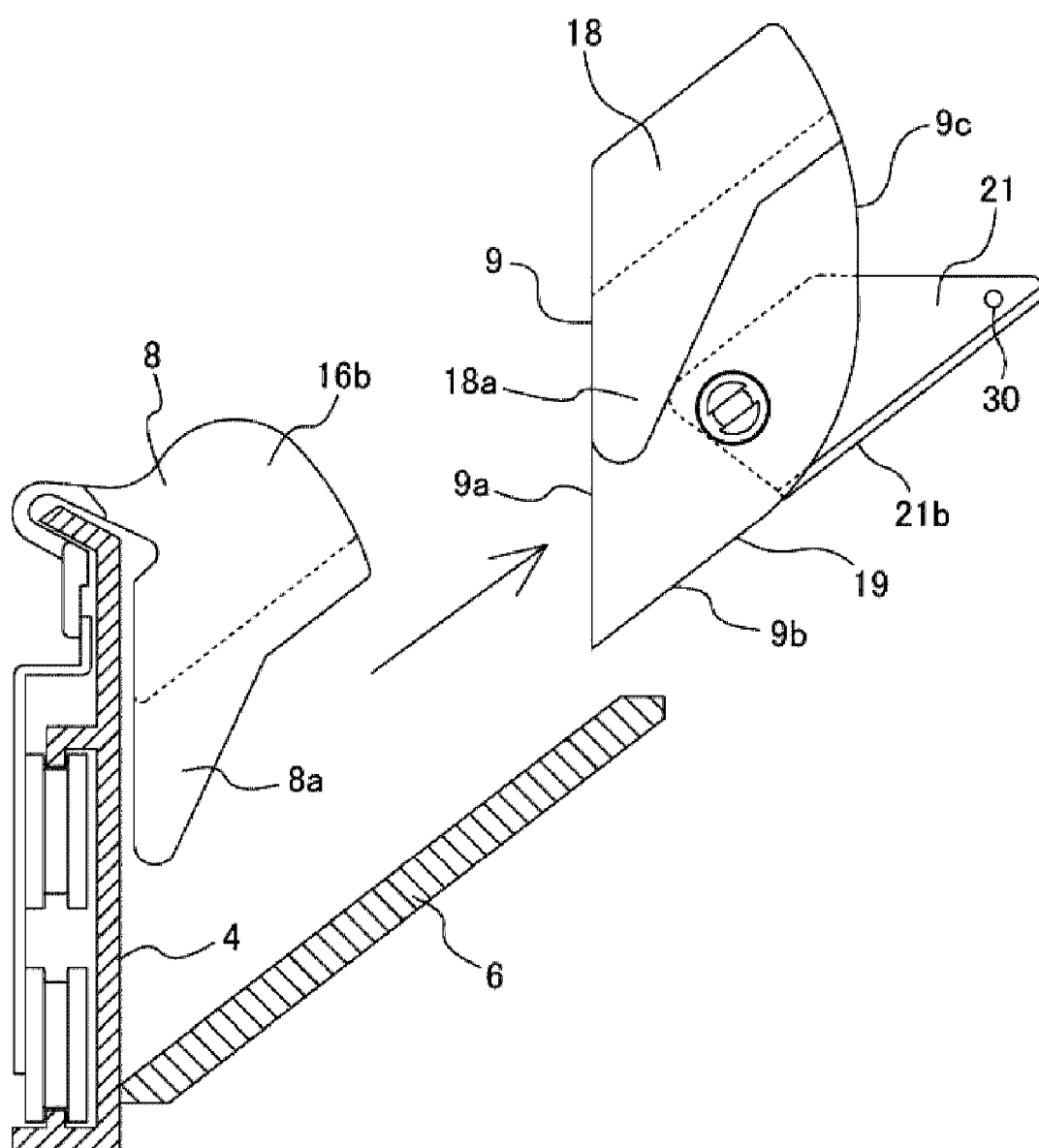


FIG. 7

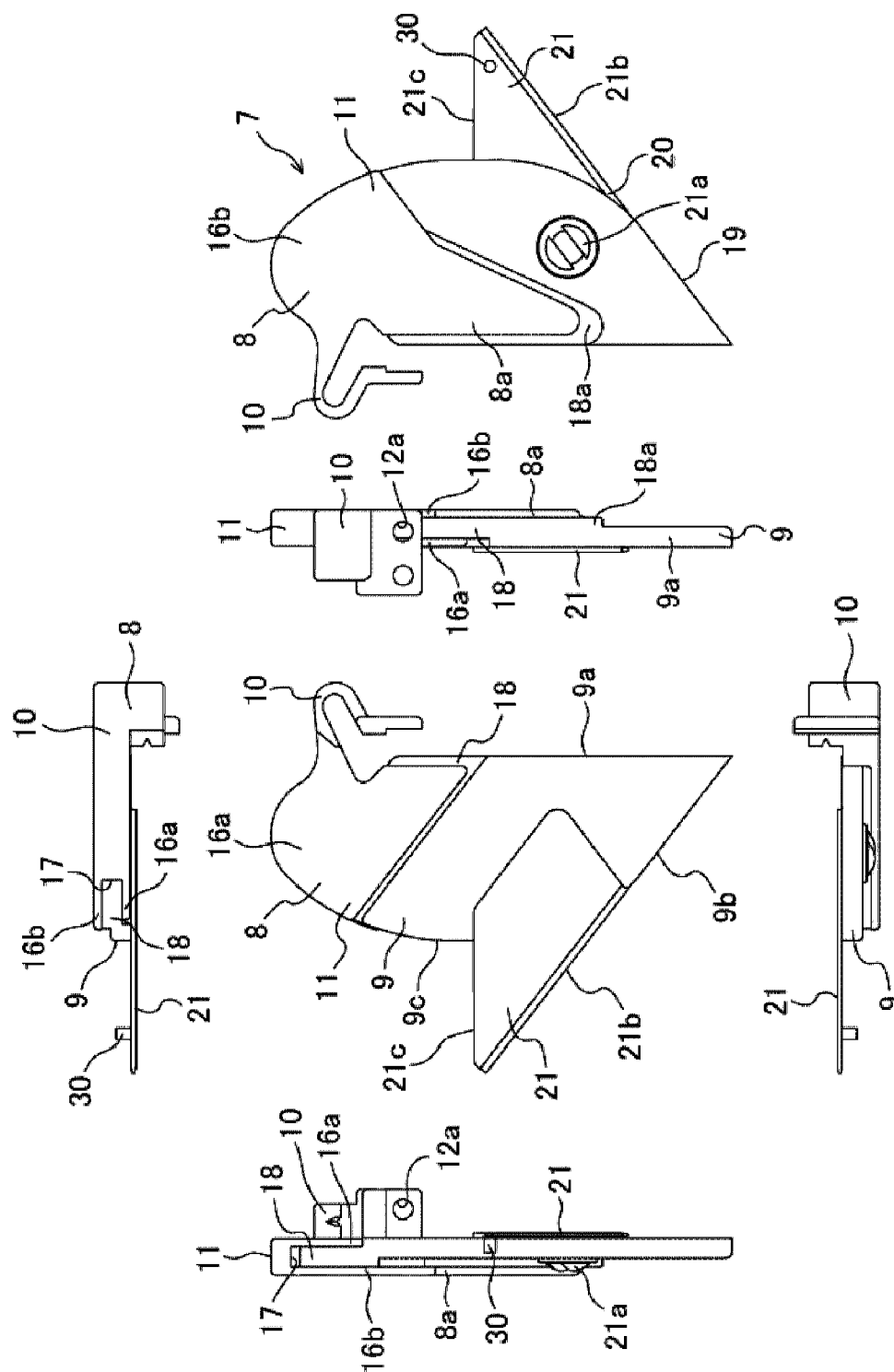


FIG. 8

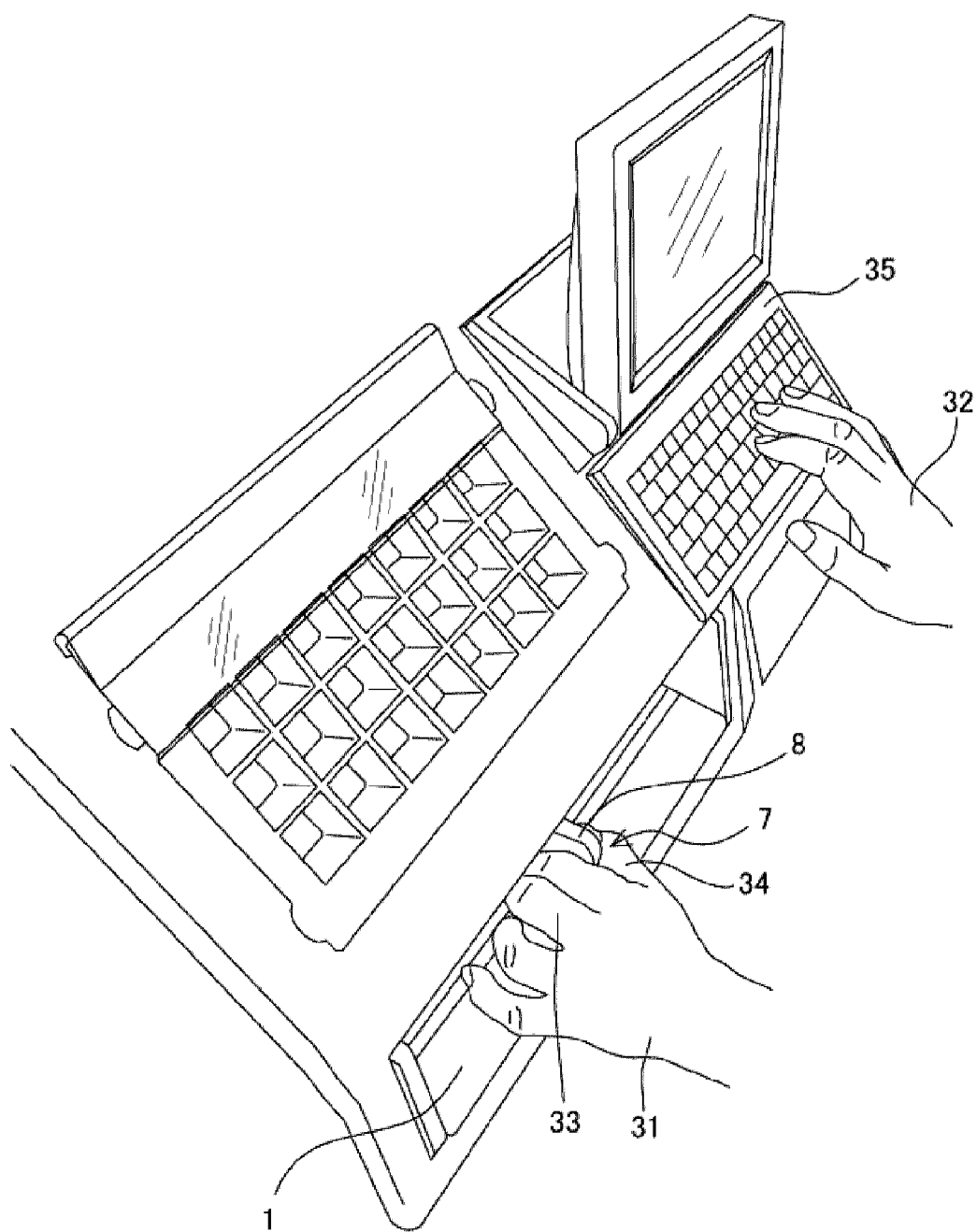


FIG. 9

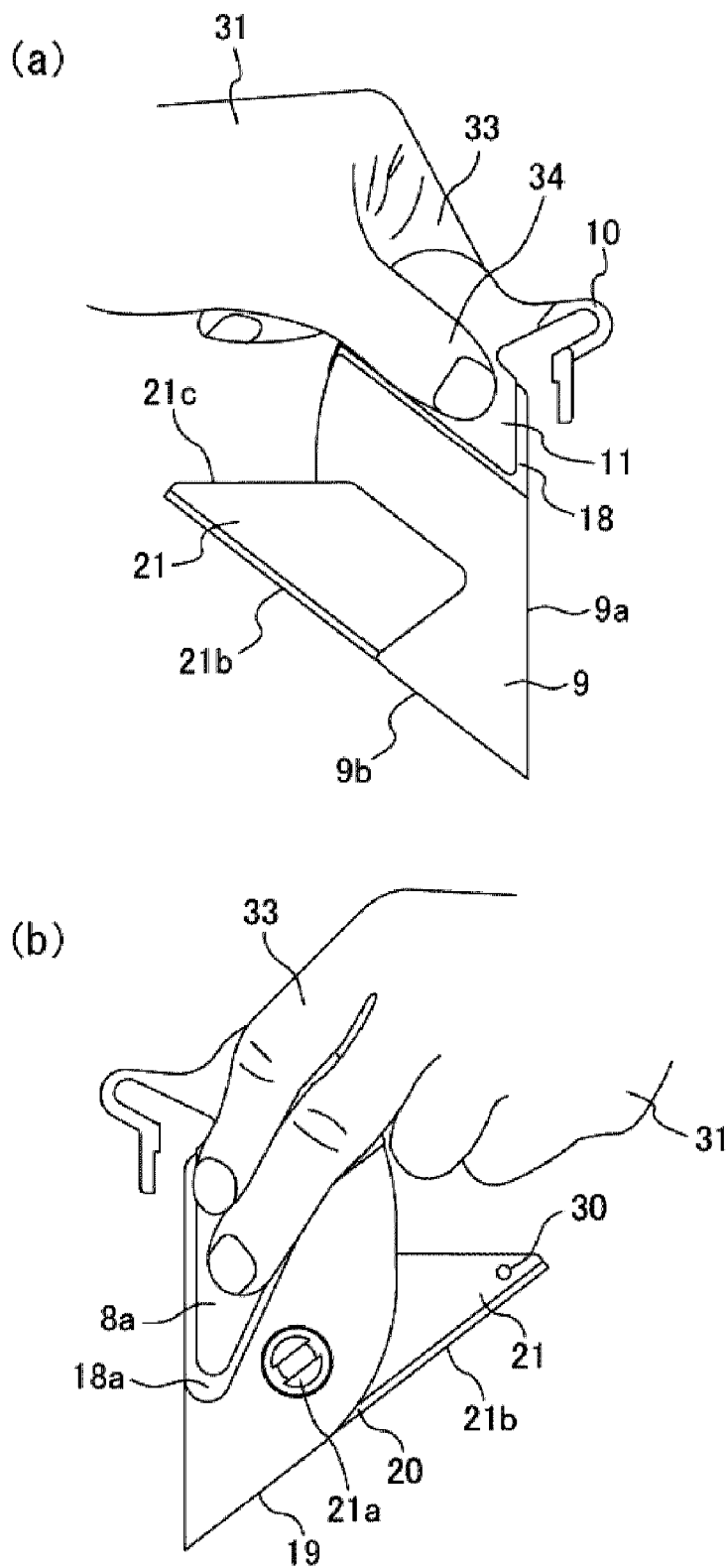


FIG. 10

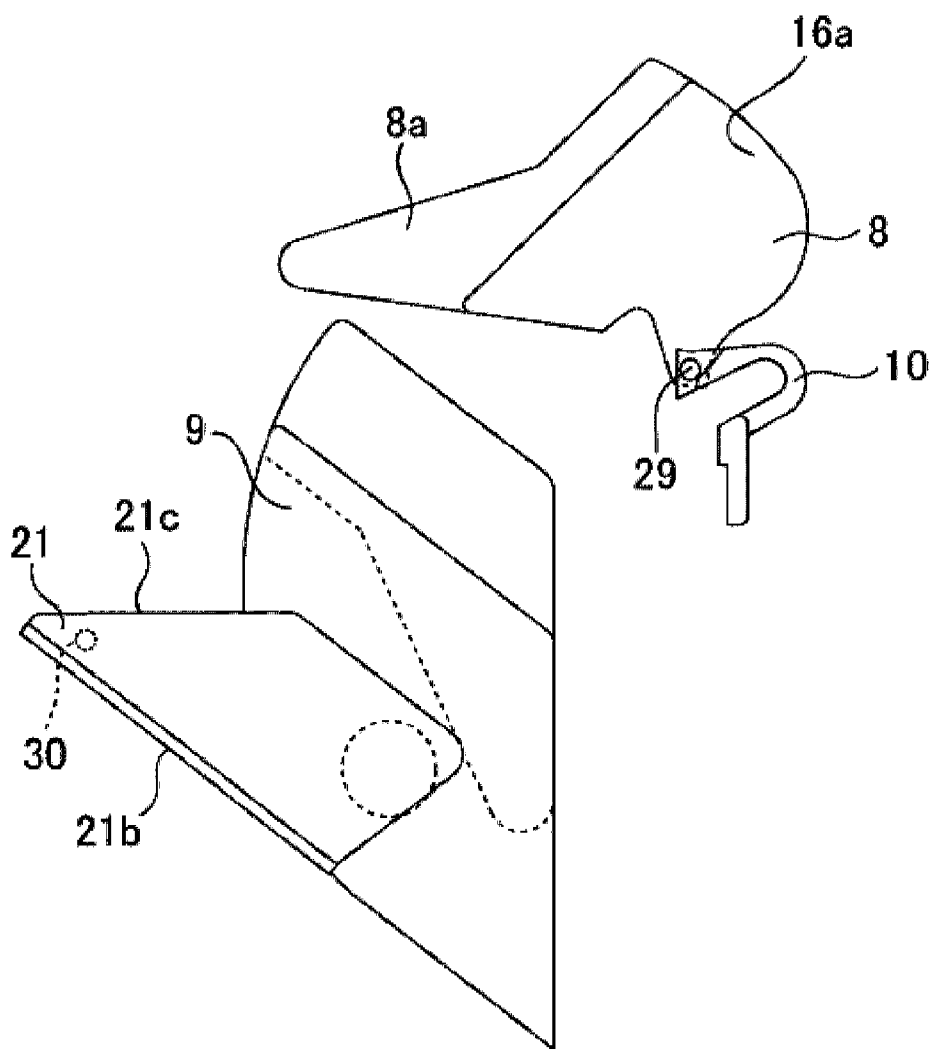
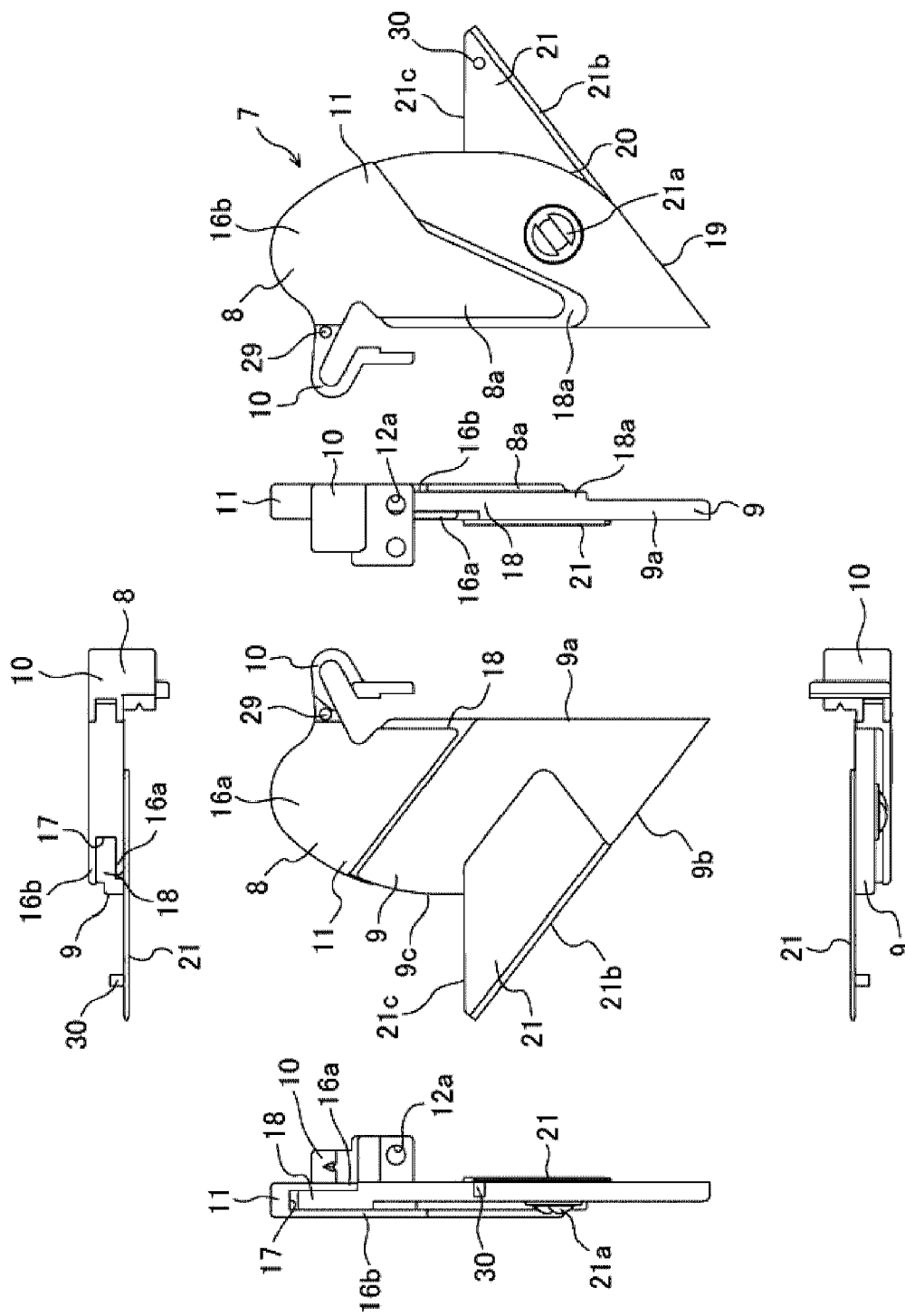


FIG. 11



PARTITION PLATE FOR USE IN V-MEASURE OF MEDICINE PACKING DEVICE

TECHNICAL FIELD

[0001] The present invention generally relates to a partition plate for use in a V-shaped measure of a medicine packing device, and more particularly to a partition plate adapted to clean a medicine remaining in a V-shaped measure and smoothly slide in the V-shaped measure.

BACKGROUND ART

[0002] There already exists in the art a medicine packing device including a V-shaped measure wherein end plates are fixed to both ends of a side plate, and wherein an opening and closing plate is provided to allow its lower edge to contact the side plate and be spaced apart therefrom. A partition plate is provided in the V-shaped measure. The partition plate is reciprocated in a length direction of the V-shaped measure while being maintained parallel to the end plates and being abutted to the side plate and the opening and closing plate. Further, it is disposed at a position corresponding to a division number of a medicine to be received (a powdered medicine in particular). Thereafter, a medicine is received in the V-shaped measure and is divided through a dividing container by opening the opening and closing plate. The medicine is then packed one pack at a time in a packing device (see, e.g., Patent Documents 1 and 2).

[0003] Patent Document 1: Japanese Laid-Open Patent Application No. 1985-58136

[0004] Patent Document 2: Japanese Laid-Open Utility Model Registration No. 2577449

SUMMARY OF THE INVENTION

[0005] However, the above-mentioned prior art partition plates are not movable with respect to the side plate. Thus, when a medicine remains in the V-shaped measure, a removal operation for such remaining medicine is obstructed. If a medicine remains in the V-shaped measure, then it causes problems such as contamination (i.e., blending of different types of medicines) when the types of medicines to be received in the V-shaped measure are changed.

[0006] Further, the partition plate closely abuts the side plate and the opening and closing plate so that the medicine cannot leak out through a gap formed between the side plate and the opening and closing plate. Thus, if the partition plate is slightly bent or distorted, then the partition plate may be trapped to the side plate or the opening and closing plate due to a friction therebetween during reciprocating movement, thereby obstructing smooth reciprocating movement of the partition plate. Particularly, it causes problems in that the partition plate is distorted when manually grasping the partition plate.

[0007] Thus, it is an object of the present invention to provide a partition plate for use in a V-shaped measure of a medicine packing device, which allows a medicine remaining in the V-shaped measure to be easily cleaned and can smoothly reciprocate in the V-shaped measure.

[0008] In order to achieve the above-mentioned objects, the present invention provides a partition plate for use in a V-shaped measure of a medicine packing device, which is disposed in a V-shaped measure, wherein end plates are fixed to both ends of a side plate, and wherein an opening and closing plate pivots between an opened position and a closed

position such that a lower edge of end plates can be brought into contact with and spaced apart from the side plate. The partition plate is reciprocated in a length direction of the side plate while being maintained parallel to the end plates by the handling of an operator to thereby adjust a division number of a medicine received in the V-shaped measure. The partition plate includes: a slide member attached so as to be reciprocated in the length direction of the side plate, the slide member including a guide receiving portion; and a partition member including a guide portion removably guided by the guide receiving portion of the slide member, the partition member being reciprocated together with the slide member while being maintained parallel to the end plates. A grasping portion for grasping the partition plate is integrally provided in the slide member.

[0009] According to such a configuration, in case a medicine is received in the V-shaped measure, if the slide member is slid up to a predetermined position, then the partition member is also moved up to the predetermined position as the guide portion is guided by the guide receiving portion. Further, in case of cleaning up a medicine remaining in the V-shaped measure after the medicine drops from the V-shaped measure by opening the opening and closing plate, the partition member can be simply removed from the slide member by only separating the guide portion from the guide receiving portion. Further, when cleaning is completed, the partition member can be simply mounted to the slide member by only guiding the guide portion to the guide receiving portion.

[0010] Further, in case of grasping and sliding the partition plate in a manual movement, if an operator grasps the partition member, then the partition member is affected by rattling in an engaging portion between the guide receiving portion and the guide portion. It causes a problem in that the partition plate is distorted and then the partition plate cannot smoothly slide. However, in the present invention, since the grasping portion is integrally provided in the slide member, grasping the grasping portion and moving the partition plate are not affected by the rattling in the engaging portion between the guide receiving portion and the guide portion and thus allow the partition plate to smoothly move. Accordingly, a medicine remaining in the V-shaped measure, which was difficult to be cleaned up in the prior art, can be easily cleaned up and the partition plate can be smoothly reciprocated in the V-shaped measure.

[0011] Further, the guide receiving portion of the slide member may include a pair of guide receiving plates provided at a predetermined interval. The guide portion of the partition member may be slidably disposed between the guide receiving plates. The grasping portion may extend from an end edge of one or both ends of the pair of guide receiving plates to cover all or a portion of the partition member.

[0012] According to such a configuration, since the grasping portion provided integrally in the slide member covers all or a portion of the partition member, the operator grasps the grasping portion when sliding the partition plate. Thus, the partition plate is not distorted for the aforementioned reasons and can be slid smoothly.

[0013] Further, the grasping portion may be formed along a position where a hand of the operator is placed on the partition plate when the operator handles the partition plate.

[0014] According to such a configuration, since the operator grasps the grasping portion when sliding the partition plate, the partition plate is not distorted for the aforemen-

tioned reasons and can be slid smoothly. Further, since the grasping portion is formed only at a position where the operator handles, the grasping portion does not need to widen in vain. Furthermore, it is possible to minimize cases wherein the grasping portion approaches a section of the V-shaped measure where the medicine is received, thereby minimizing causes of packing error.

[0015] Further, the grasping portion may be formed along a position where fingers except for a thumb in any one of left and right hands of the operator are placed.

[0016] According to such a configuration, since the operator grasps the grasping portion when sliding the partition plate, the partition plate is not distorted for the aforementioned reasons and can be slid smoothly. Further, since the grasping portion is formed by considering which hand is used by the operator, it is possible to designate fingers to be handled and further prevent a waste with regard to forming the grasping portion. Thus, it is possible to minimize cases wherein the grasping portion approaches a section of the V-shaped measure where the medicine is received, thereby minimizing causes of packing error.

[0017] Further, the partition member may contact the grasping portion in a section opposite to the grasping portion.

[0018] According to such a configuration, the partition member is supported as contacted to the grasping portion and is thereby reinforced. Thus, when the operator grasps the grasping portion, the grasping portion is difficult to bend.

[0019] Further, the partition member may include an auxiliary member pivotably attached to the partition member. The auxiliary member may pivot according to pivoting of the opening and closing plate to maintain an abutment state with respect to the opening and closing plate. The auxiliary member may include a protruding portion, which abuts an edge of the partition plate within a range not to obstruct the abutment state with respect to the opening and closing plate to thereby restrict a pivotal movement of the auxiliary member.

[0020] According to such a configuration, the partition member can always be in an appropriate position with respect to the slide member, although the opening and closing plate is opened. In addition, the auxiliary member can be positioned to even a region uncovered by the partition member. Accordingly, when the medicine leaks out laterally through a gap formed between the partition member and the opening and closing plate by opening the opening and closing plate, the auxiliary member can prevent such leakage. Further, the protruding portion is provided in the auxiliary plate. Thus, although the auxiliary plate is unnecessarily pivoted to be spaced from the opening and closing plate when the removed partition member is mounted to the slide member, the protruding portion can restrict the rotation of the auxiliary plate to a range wherein the auxiliary plate can return to the abutment state to the opening and closing plate. As such, it is possible to prevent a failure that a medicine is fed into the V-shaped measure by mistake when the partition member is mounted to the slide member with the auxiliary plate spaced apart from the opening and closing plate.

[0021] According to the present invention, the partition plate comprises the slide member and the partition member removable from the slide member. Accordingly, it is possible to easily clean up a medicine remaining in the V-shaped measure, which was difficult to be cleaned up in the prior art. Further, since the grasping portion is integrally provided in the slide member, grasping the grasping portion and handling the partition plate in the manual movement are not affected by

a distortion of the partition plate caused by rattling in an engaging portion between the slide member and the partition member. Accordingly, the partition plate can be smoothly reciprocated in the V-shaped measure without any jam.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] FIG. 1 is a perspective view of a medicine packing device according to the present embodiment.

[0023] FIG. 2 is a sectional view showing a V-shaped measure shown in FIG. 1.

[0024] FIG. 3(a) is a perspective view of a partition plate and FIG. 3(b) is a partially enlarged view of a slide receiving portion thereof.

[0025] FIG. 4 is a sectional view showing an opening and closing plate in a closed position.

[0026] FIG. 5 is a sectional view showing the opening and closing plate in an opened position.

[0027] FIG. 6 is a sectional view showing that a partition member is removed from a slide member.

[0028] FIG. 7 shows six views of a partition plate according to a first embodiment.

[0029] FIG. 8 is a partially enlarged perspective view showing a medicine packing device according to the present embodiment.

[0030] FIG. 9(a) is a front view showing a partition plate grasped by a hand and FIG. 9(b) is another front view of the partition plate grasped by the hand.

[0031] FIG. 10 is a front view showing a removed partition plate according to a second embodiment.

[0032] FIG. 11 shows six views of the partition plate according to the second embodiment.

DESCRIPTION OF REFERENCE NUMERALS

- [0033] 1 . . . V-shaped Measure
- [0034] 2 . . . Dividing Container
- [0035] 3 . . . Hopper
- [0036] 4 . . . Side Plate
- [0037] 4a . . . Upper End Portion
- [0038] 4b . . . Lower End Portion
- [0039] 4c, 4d . . . Protrusion claws
- [0040] 5 . . . End Plate
- [0041] 6 . . . Opening and Closing Plate
- [0042] 6a . . . Supporting Shaft
- [0043] 7 . . . Partition Plate
- [0044] 8 . . . Slide Member
- [0045] 8a . . . Grasping Portion
- [0046] 9 . . . Partition Member
- [0047] 9a . . . Side-plate-facing Edge Portion
- [0048] 9b . . . Lower Edge Portion
- [0049] 9c . . . Outer Edge Portion
- [0050] 10 . . . Slide Receiving Portion
- [0051] 11 . . . Guide Receiving Portion
- [0052] 12 . . . Extension Portion
- [0053] 12a . . . Through Aperture
- [0054] 13 . . . Holding Plate
- [0055] 14 . . . Roller
- [0056] 14a . . . Circumferential Groove
- [0057] 15 . . . Detected Portion
- [0058] 16a, 16b . . . Guide Receiving Plates
- [0059] 17 . . . Guide Groove
- [0060] 18 . . . Guide Portion
- [0061] 18a . . . Support Portion
- [0062] 19 . . . First Abutment Portion

[0063]	20	Second Abutment Portion
[0064]	21	Auxiliary Plate
[0065]	21a	Shaft Portion
[0066]	21b	Lower Edge Portion
[0067]	21c	Inclined Edge Portion
[0068]	22	Supporting Mount
[0069]	23	Motor
[0070]	24	Rack
[0071]	25	Pinion
[0072]	26	Encoder
[0073]	27	Sensor
[0074]	28	Cleaner
[0075]	29	Hinge Portion
[0076]	30	Protruding Portion
[0077]	31	Left Hand
[0078]	32	Right Hand
[0079]	33	Fingers except for thumb
[0080]	34	Thumb
[0081]	35	Input Interface

DETAILED DESCRIPTION

[0082] Embodiments of the present invention will be described with reference to the accompanying drawings.

First Embodiment

[0083] FIG. 1 illustrates a medicine packing device according to the present embodiment. The medicine packing device generally includes the following: a V-shaped measure 1; a plurality of dividing containers 2 disposed below the V-shaped measure 1; and a hopper 3 for sequentially receiving a medicine from each of the dividing containers 2, similar to a conventional packing device (not shown). The V-shaped measure 1 is provided at a left side of the medicine packing device. An input interface 35 such as a PC for inputting various data on a packing operation such as a patient's name, a dose, etc. is provided at a right side of the medicine packing device.

[0084] In the V-shaped measure 1, as shown in FIG. 2, an end plate 5 is fixed to both ends of a side plate 4.

[0085] An upper end portion 4a of the side plate 4 protrudes obliquely backward, while a lower end portion 4b thereof extends backward at a right angle (horizontally). A central portion of the lower end portion is formed with a protrusion claw 4c. Further, a back side of the side plate 4 is formed with a protrusion claw 4d, which is opposed to the protrusion claw 4c of the lower end portion.

[0086] The end plate 5 is provided with an opening and closing plate 6 that is pivotable about a supporting shaft 6a. The opening and closing plate 6 is pivoted about the supporting shaft 6a between an opened position and a closed position by the drive of a motor (not shown). This allows its lower edge to be brought into contact with a lower edge of the side plate 4 and be spaced apart therefrom. In the closed position, the opening and closing plate 6 and the side plate 4 define a substantially V-shaped cross-section.

[0087] Further, a single partition plate 7 is disposed in the V-shaped measure 1. Medicine is inputted into one side (in this embodiment, a left side of the device) of the V-shaped measure 1, which is partitioned into two sections in a length direction by the partition plate 7. The amount of the medicine may be adjusted according to a desired division number by

freely changing a position of the partition plate 7 depending on how many equal portions the medicine must be divided into.

[0088] The partition plate 7 includes a slide member 8 and a partition member 9, as shown in FIGS. 3(a) and 7.

[0089] The slide member 8 includes: a slide receiving portion 10 slidably movably guided along an upper edge of the side plate 4; and a guide receiving portion 11 extending from the slide receiving portion 10 forward of the side plate 4 (i.e., inwardly of the V-shaped measure 1). The slide member 8 is integrally formed using a material having a high stiffness such as stainless steel, etc.

[0090] The slide receiving portion 10 has a U-shaped cross section. The slide receiving portion is reciprocated along the upper end portion 4a that protrudes obliquely backward from the side plate 4, while guided by the upper end portion 4a. An extension portion 12 extends from one end portion of the slide receiving portion 10 (i.e., an end portion located at the back side of the side plate 4). As shown in FIG. 3(b), two through-apertures 12a, to which a holding plate 13 is secured by means of screws, are formed at two places in a lower side of the extension portion 12.

[0091] Pairs of rollers 14, which are vertically juxtaposed, are rotatably attached to one side of the holding plate 13. A peripheral surface of the roller 14 is formed centrally along its circumferential direction with a circumferential groove 14a. The protrusion claws 4c, 4d, which are formed upwardly and downwardly on the back side of the side plate 4, are placed on and guided by the circumferential groove 14a. Further, the holding plate 13 is provided at its opposite side, which is not facing toward the side plate 4, with a detected portion 15 including a pair of vertically arranged permanent magnets. The detected portion 15 is detected by a sensor 27, which will be described later, and is used for determining a position of the partition plate 7.

[0092] The guide receiving portion 11 extends from the slide receiving portion 10 and gradually expands to occupy an upper side of the V-shaped measure 1. An edge portion of the guide receiving portion 11, which faces toward the side plate 4, is positioned with a little gap from the upper end portion of the side plate 4 along the front side thereof, thereby avoiding interference during a sliding movement (i.e., occurrence of friction resistance). Further, an edge portion of the guide receiving portion 11, which is opposed to the side plate 4, bulges in a circular arc shape. Furthermore, a lower half section of the guide receiving portion 11 defines a guide groove 17, in which a guide portion 18 of the partition member 9 (as will be described later) is located, by guide receiving plates 16a, 16b opposed to each other with a predetermined gap. Lower edges of the guide receiving plates 16a, 16b and a bottom surface of the guide groove 17 are parallel to the opening and closing plate 6, which is in the closed position. The lower edge of the guide receiving plate 16a (a right side in the front side of the device) is placed slightly below the lower edge of the guide receiving plate 16b (a left side in the front side of the device).

[0093] A grasping portion 8a, which extends from a lower edge of the guide receiving plate 16b to cover a portion of the partition member 9, is integrally formed on the guide receiving plate 16b. As shown in FIG. 4 or FIG. 7, the grasping portion 8a is formed in such a manner that its edge portion extends to an approximately halfway point in a depth direction of the V-shaped measure 1 while facing toward the side plate 4, and further extends down from the halfway point

while curving toward an opposite side to the side plate 4. It then extends up with an approximately same curvature as that of said curving, and extends obliquely toward the opposite side to the side plate 4 to reach an approximately halfway point of the lower edge of the guide receiving plate 16b in a length direction thereof. That is, when assuming that an operator handles the partition plate 7 with his/her left hand 31 as shown in FIGS. 8 and 9, the grasping portion 8a is formed along a position where fingers 33 except for a thumb of an operator's left hand 31 is placed when the operator grasps the partition plate 7 to handle the partition plate 7. In this case, the thumb 34 of the operators' left hand 31 is placed on the guide receiving plate 16a. Although not shown in the figures, the guide receiving plate 16a may be formed with a grasping portion on which the thumb 34 of the left hand 31 of the operator can be placed.

[0094] In this embodiment, it is assumed that the partition plate 7 is handled with the left hand 31. This is because the V-shaped measure 1 is disposed at the left side of the device and the input interface 35 is disposed at the right side of the device as shown in FIG. 8. Thus, the operator necessarily manipulates the input interface 35 with the right hand 32, while handling the partition plate 7 of the V-shaped measure 1 with the left hand 31. Accordingly, according to the arrangement of the V-shaped measure 1 and the input interface 35, the partition plate 7 may be configured to be dedicated for the right hand or correspond to the both hands.

[0095] As shown in FIG. 3, the partition member 9 is formed by molding a synthetic resin material in order to decrease any damage to the side plate 4 and the opening and closing plate 6. An upper side of the partition member 9 is formed with the guide portion 18, which is slidably disposed in the guide groove 17. The guide portion 18 and the guide groove 17 are contacted to each other so that they can easily slide without rattling and without any interference. Further, as clearly shown in FIGS. 3 and 6, a section of the partition member 9, which is opposed to the grasping portion 8a of the slide member 8, is formed with a support portion 18a that contacts the grasping portion 8a and has the same shape as the grasping portion 8a. A surface of the support portion 18a is coplanar with the surface of the guide portion 18. The support portion 18a functions as a guide portion, which is guided by the grasping portion 8a.

[0096] A side-plate-facing edge portion 9a of the partition member 9 is straight shaped and abuts the side plate 4. A lower edge portion 9b of the partition member 9 is inclined with respect to the side-plate-facing edge portion 9a and defines a first abutment portion 19 that abuts the opening and closing plate 6 in the closed position. An edge portion 9c (outer edge portion) of the partition member 9, which is joined to the lower edge portion 9b and is opposed to the side-plate-facing edge portion 9a, is formed with a second abutment portion 20 that abuts the opening and closing plate 6 in an opened position. The remainder of the outer edge portion 9c is formed in a circular arc or in a multi-tapered shape so as to conform to a rotation trajectory of the opening and closing plate 6. Further, an occupation space in a height direction of the partition member 9 is sized such that partitioning of a medicine can be well performed even in case of a maximum amount of medicine for one pack.

[0097] Further, an auxiliary plate 21 is attached to the partition member 9 so as to be pivotable about a shaft portion 21a. The auxiliary plate 21 is disposed through the shaft portion 21a in such a manner that its one end side is super-

posed on the partition member 9 in a section of the V-shaped measure 1 where the medicine is not received and the other end side is exposed toward a section of the V-shaped measure 1 where the medicine is received. Further, as shown in FIGS. 4 and 5, the shaft portion 21a is positioned near the supporting shaft 6a, which is a rotation center of the opening and closing plate 6. The auxiliary plate 21 is thin-plate-shaped. One end of a lower edge portion 21b of the auxiliary plate is located at a boundary between the first abutment portion 19 and the second abutment portion 20 of the partition member 9. Further, an inclined edge portion 21c inclined with respect to the lower edge portion is formed at the other end of the lower edge portion 21b. Also, when the opening and closing plate 6 is in the closed position as shown in FIG. 4, the lower edge portion 21b abuts the opening and closing plate 6 together with the first abutment portion 19 of the partition member 9 so as to extend in the same line. On the other hand, when the opening and closing plate 6 is in the opened position as shown in FIG. 5, the lower edge portion 21b abuts the opening and closing plate 6 together with the second abutment portion 20 of the partition member 9. Thus, although the opening and closing plate 6 is rotated, the auxiliary plate 21 always maintains an abutment state with respect to the opening and closing plate 6. As such, it covers a gap formed between the outer edge portion 9c of the partition member 9 and the opening and closing plate 6, thereby preventing the medicine from overflowing laterally (not down to the dividing container 2).

[0098] Further, a protruding portion 30, which protrudes perpendicularly to a surface of the auxiliary plate 21 where the medicine is received, is provided in the auxiliary plate 21 at the section of the V-shaped measure 1 where the medicine is received. The protruding portion 30 abuts the edge of the partition member 9 (i.e., the lower edge portion 9b and the outer edge portion 9c) to restrict a pivotal range of the auxiliary plate 21. The protruding portion 30 is positioned so as not to abut the partition member 9 while the opening and closing plate 6 operates from the opened position to the closed position. Further, the protruding portion is configured so as not to disturb the operation of the opening and closing plate 6.

[0099] As shown in FIG. 2, the dividing containers 2 are disposed below the V-shaped measure 1. Further, the dividing containers are configured such that at least as many ones as a pack number (the division number of a medicine received in the V-shaped measure 1) can be continuously arranged without any gaps. The dividing container 2 is supported by a supporting mount 22. It is reciprocally movable along a length direction of the V-shaped measure 1 through an interposed rack 24 and a pinion 25 by the drive of a motor 23. A revolution amount, a revolution angle, a revolution position, etc. of the motor 23 are detected by an encoder 26. Further, a sensor 27 is provided in the supporting mount 22 to detect the detected portion 15 provided in the holding plate 13. The medicine, which drops from the V-shaped measure by opening the opening and closing plate 6 in a position where the sensor 27 detects the detected portion 15, is equally partitioned by and received in the dividing containers 2 as many as the division number set through the partition plate 7. A bottom plate 2a, which can be opened and closed, is provided at a bottom of each dividing container 2. As the bottom plates 2a are opened one after the other, the partitioned medicine is fed to a packing device and is then packed one pack at a time.

[0100] The medicine packing device configured as described above equally partitions a medicine and packs the same as follows.

[0101] First, the partition plate 7 is grasped and manually moved and is stopped at a position where a division number corresponds to a pack number for packing. In this case, when an operator grasps and moves the partition member 9 of the partition plate 7, it is difficult to eliminate rattling between the guide portion 18 and the guide groove 17 due to a slide movement therebetween. Further, since the partition member 9 is made from a resin material, the partition plate 7 can flex overall and thus the partition plate 7 cannot smoothly move. In this regard, according to this embodiment, the grasping portion 8a, which an operator can grasp, is provided in the slide member 8. Therefore, during manual movement, grasping the grasping portion exerts a stress on the grasping portion 8a which is made from a stainless material and has stiffness. Thus, the partition plate 7 becomes difficult to flex when compared to strongly grasping the partition member 9, thereby rendering the movement of the partition plate 7 smooth. Further, the partition member 9 is formed in the section opposite the grasping portion 8a of the slide member 8 with the support portion 18a, which has the same shape as the grasping portion 8a and contacts the grasping portion 8a. Thus, the support portion 18a is supported and reinforced by contacting the grasping portion 8a having a thin-plate-shape. As a result, when an operator grasps the grasping portion 8a, the support portion is difficult to flex.

[0102] Then, the medicine is received in the V-shaped measure 1. In this case, as shown in FIG. 4, the partition member 9 of the partition plate 7 allows its first abutment portion 19 to abut the surface of the opening and closing plate 6, which is inclined in the closed position, by means of its own weight. Also, a reaction force caused by such abutment allows the side-plate-facing edge portion 9a to abut a surface of the side plate 4. Thus, an excellent partition state can be accomplished. Further, the motor 23 is driven and each of the dividing containers 2 is moved so that all the medicines dropping from the V-shaped measure 1 can be collected by the dividing container 7.

[0103] Subsequently, the opening and closing plate 6 is pivoted about the supporting shaft 6a by the drive of a motor (not shown) to thereby be opened as its lower edge portion is spaced apart from the side plate 4. In this case, the partition member 9 gradually releases an abutment state of the first abutment portion 19 from a state where the first abutment portion abuts the opening and closing plate 6 is in the closed position, while the second abutment portion 20 approaches the opening and closing plate 6. Also, when the opening and closing plate 6 goes into the opened position, the second abutment portion 20 abuts the opening and closing plate 6 as shown in FIG. 5 and a further opening operation is prohibited. Further, the auxiliary plate 21 is pivoted about the shaft portion 21a while maintaining its abutment state with respect to the opening and closing plate 6. That is, no gap is formed in the partition position accomplished by the partition plate 7, although the opening and closing plate 6 is opened. Further, since the weight of the partition member 9 maintains the abutment state between the opening and closing plate 6 and the side plate 4 during pivoting of the opening and closing plate 6, a gap is difficult to form and an excellent partition state can be accomplished when compared to the prior art. Accordingly, all the medicines dropping from the V-shaped measure are collected by the dividing containers 2 located below without laterally overflowing and are equally partitioned.

[0104] Next, the dividing containers 2 are moved by the drive of the motor 23 and are situated above the hopper 3 one after another. Thereafter, the bottom plates of the dividing

containers 2 situated above the hopper 3 are opened one after another and the medicine is packed one pack at a time.

[0105] As such, the medicine in the V-shaped measure is divided into the dividing containers 2 and is then packed one pack at a time in the packing device. Thereafter, cleaning of the inside of the V-shaped measure 1 is conducted before feeding the next medicine into the V-shaped measure. Such cleaning of the inside of the V-shaped measure 1 is performed such that a cleaner 28 (which is equipped in the medicine packing device) sucks in the remaining medicine. Before such cleaning, however, the partition member 9 of the partition plate 7 is removed as shown in FIG. 6. Since the partition member 9 is situated with its guide portion 18 guided by the guide receiving portion 11 of the slide member 8, it can be simply removed by grasping and obliquely upward sliding it along the opening and closing plate 6. Accordingly, it is possible to simply and completely remove even a medicine remaining in a section concealed by the partition plate 7, which was difficult to be cleaned in the prior art. In addition, cleaning of the partition plate 7 itself can be easily performed.

[0106] When such cleaning is completed, the partition member 9 can simply return to its original state by guiding its guide portion between the guide receiving portions 11 of the slide member 8 while it slides along the opening and closing plate 6.

[0107] Further, the auxiliary plate 21 is provided with the protruding portion 30. Thus, although the auxiliary plate 21 is unnecessarily pivoted to be spaced from the opening and closing plate 6 when the partition member 9 is mounted to the slide member 8 after cleaning, the protruding portion can restrict the rotation of the auxiliary plate 21 to a range wherein the auxiliary plate 21 can return to the abutment state to the opening and closing plate 6 due to its own weight. Therefore, it is possible to prevent a failure that a medicine is fed into the V-shaped measure 1 by mistake in a state where the partition member 9 is mounted to the slide member 8 with the auxiliary plate 21 spaced apart from the opening and closing plate 6.

[0108] Further, the partition plate 7 is manually reciprocated as described above. However, to cope with both the manual movement and the automatic movement, another drive motor (not shown) may be provided.

Second Embodiment

[0109] FIGS. 10 and 11 show a partition plate 7 according to a second embodiment.

[0110] The partition plate 7 is configured similarly to that of the first embodiment except that a leading end portion of the slide member 8, namely, its guide receiving portion 11 side, is connected to the slide receiving portion 10 side so as to be pivotable about a hinge portion 29.

[0111] With the partition plate 7 configured as such, in case of cleaning the inside of the V-shaped measure 1, the partition member 9 can be easily removed from the inside of the V-shaped measure 1 by pivoting the guide receiving portion 11 side of the slide member 8 about the hinge portion 29 as shown in FIG. 8. In addition, a portion of the slide member 8, which is placed inside the V-shaped measure 1 (including its upper side), can also be withdrawn. Accordingly, cleaning the inside of the V-shaped measure can be smoothly performed without any obstruction.

[0112] Furthermore, the partition member 9 can be removed prior to pivoting a portion of the slide member 8 by being slidably moved along the opening and closing plate 6 similarly to the first embodiment.

1. A partition plate for use in a V-shaped measure of a medicine packing device, the partition plate being disposed in a V-shaped measure, wherein end plates are fixed to both ends

of a side plate and an opening and closing plate pivots between an opened position and a closed position so that a lower edge thereof can be brought into contact with and spaced apart from the side plate, the partition plate being reciprocated in a length direction of the side plate while being maintained parallel to the end plates by an operator to thereby adjust a division number of a medicine received in the V-shaped measure, the partition plate comprising:

a slide member attached so as to be reciprocated in the length direction of the side plate, the slide member including a guide receiving portion; and

a partition member including a guide portion removably guided by the guide receiving portion of the slide member, the partition member being reciprocated together with the slide member while being maintained parallel to the end plates,

wherein a grasping portion for grasping the partition plate is integrally provided in the slide member.

2. The partition plate of claim 1, wherein the guide receiving portion of the slide member includes a pair of guide receiving plates provided at a predetermined interval and the guide portion of the partition member is slidably disposed between the guide receiving plates,

wherein the grasping portion extends from an end edge of one or both of the pair of guide receiving plates to cover all or a portion of the partition member.

3. The partition plate of claim 1, wherein the grasping portion is formed along a position where a hand of an operator is placed on the partition plate when the operator handles the partition plate.

4. The partition plate of claim 1, wherein the grasping portion is formed along a position where fingers except for a thumb in any one of left and right hands of an operator are placed.

5. The partition plate of claim 1, wherein the partition member contacts the grasping portion in a section opposite to the grasping portion.

6. The partition plate of claim 1, wherein the partition member includes an auxiliary member pivotably attached to the partition member, the auxiliary member pivoting according to pivoting of the opening and closing plate to maintain an abutment state with respect to the opening and closing plate, wherein the auxiliary member includes a protruding portion, the protruding portion abutting an edge of the partition plate within a range not to obstruct the abutment state with respect to the opening and closing plate to thereby restrict a pivotal movement of the auxiliary member.

7. The partition plate of claim 2, wherein the grasping portion is formed along a position where a hand of an operator is placed on the partition plate when the operator handles the partition plate.

8. The partition plate of claim 2, wherein the grasping portion is formed along a position where fingers except for a thumb in any one of left and right hands of an operator are placed.

9. The partition plate of claim 3, wherein the grasping portion is formed along a position where fingers except for a thumb in any one of left and right hands of an operator are placed.

10. The partition plate of claim 7, wherein the grasping portion is formed along a position where fingers except for a thumb in any one of left and right hands of an operator are placed.

11. The partition plate of claim 2, wherein the partition member contacts the grasping portion in a section opposite to the grasping portion.

12. The partition plate of claim 3, wherein the partition member contacts the grasping portion in a section opposite to the grasping portion.

13. The partition plate of claim 4, wherein the partition member contacts the grasping portion in a section opposite to the grasping portion.

14. The partition plate of claim 7, wherein the partition member contacts the grasping portion in a section opposite to the grasping portion.

15. The partition plate of claim 2, wherein the partition member includes an auxiliary member pivotably attached to the partition member, the auxiliary member pivoting according to pivoting of the opening and closing plate to maintain an abutment state with respect to the opening and closing plate, wherein the auxiliary member includes a protruding portion, the protruding portion abutting an edge of the partition plate within a range not to obstruct the abutment state with respect to the opening and closing plate to thereby restrict a pivotal movement of the auxiliary member.

16. The partition plate of claim 3, wherein the partition member includes an auxiliary member pivotably attached to the partition member, the auxiliary member pivoting according to pivoting of the opening and closing plate to maintain an abutment state with respect to the opening and closing plate, wherein the auxiliary member includes a protruding portion, the protruding portion abutting an edge of the partition plate within a range not to obstruct the abutment state with respect to the opening and closing plate to thereby restrict a pivotal movement of the auxiliary member.

17. The partition plate of claim 4, wherein the partition member includes an auxiliary member pivotably attached to the partition member, the auxiliary member pivoting according to pivoting of the opening and closing plate to maintain an abutment state with respect to the opening and closing plate, wherein the auxiliary member includes a protruding portion, the protruding portion abutting an edge of the partition plate within a range not to obstruct the abutment state with respect to the opening and closing plate to thereby restrict a pivotal movement of the auxiliary member.

18. The partition plate of claim 5, wherein the partition member includes an auxiliary member pivotably attached to the partition member, the auxiliary member pivoting according to pivoting of the opening and closing plate to maintain an abutment state with respect to the opening and closing plate, wherein the auxiliary member includes a protruding portion, the protruding portion abutting an edge of the partition plate within a range not to obstruct the abutment state with respect to the opening and closing plate to thereby restrict a pivotal movement of the auxiliary member.

19. The partition plate of claim 7, wherein the partition member includes an auxiliary member pivotably attached to the partition member, the auxiliary member pivoting according to pivoting of the opening and closing plate to maintain an abutment state with respect to the opening and closing plate, wherein the auxiliary member includes a protruding portion, the protruding portion abutting an edge of the partition plate within a range not to obstruct the abutment state with respect to the opening and closing plate to thereby restrict a pivotal movement of the auxiliary member.