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(54) A lock mechanism for paper abutting scale in a paper cutter

(57) In a paper cutter, on the paper putting stand, a pair of guide grooves 10 are provided in parallel and spacing each other, the paper abutting scale 3 is provided in such a manner as it can slide along the guide grooves and it is provided with the push-contacting plates 15 to be contacted to the walls of the guide grooves 10 and the pushing plate 14, wherein by making the pushing plate 14 drive by inclining the lever 17 to push the push-contacting plate 15 against the wall of the guide grooves to brake and fix the paper abutting scale 3 on the guide grooves 10. Thereby, the positioning of the papers to be cut is carried out easily by one touch and the paper cutting efficiency is increased.

FIG.1(a)

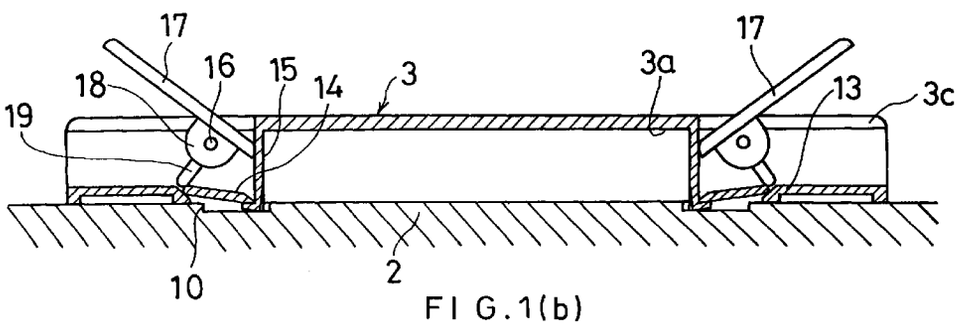
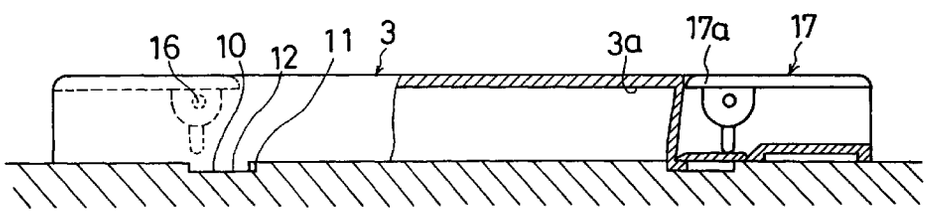


FIG.1(b)



EP 0 953 414 A2

Description

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0001] In order to arrange the size of sheet of paper or make scraps for information, a paper cutter is made use. In this type of cutter, the paper cutters which are formed by combination of a paper putting stand for papers and a cutter have been known. The present invention relates to a lock mechanism for a paper abutting scale to be put on the paper putting stand.

DESCRIPTION OF THE PRIOR ART

[0002] Conventionally, a paper cutter has been provided with ruled markings indicating such as plotting, markings ruled into A4 or B5 scale on the cutting end portion of a paper putting stand. In this case, when cutting papers while holding them to be cut, if the hand to hold the papers moves by chance, which causes the papers to be displaced. For avoiding that, a paper abutting scale has been adapted to be provided in parallel with the cutter.

[0003] As a paper abutting scale, a linear and thick one in section is used, of such scales there have been such type as embedding a magnet inside the paper abutting scale to be attracted to the paper putting stand. Further, there has been employed a screw-holding type which is held firmly by clamping with screws both ends of the paper abutting scale to the paper putting stand.

[0004] However, in the paper abutting scale using the above magnet, if the attraction force is weak, the scale is easily moved, on the other hand if it is too strong, it is difficult to remove the magnet from the stand to arrange it finely. In addition, the magnet hurts the stand some time.

[0005] Further, in the case where the paper abutting scale is fixed by screws, it is easy to arrange it for positioning and can be fixed securely, however, it is troublesome to clamp the screws every time and the screw holes are generated to be followed by loosening of clamping at the time of mounting the paper abutting scale accordingly, when clamping the screws, a profound caution is required.

[0006] The purpose of the present invention is to provide a lock mechanism for paper abutting scale which can position the papers to be cut easily and securely by one operation.

SUMMARY OF THE INVENTION

[0007] The present invention is characterized in that, in order to attain the above purpose, on a paper putting stand of a paper cutter, a guide portion is provided by being extended perpendicular to the paper cutting direction, a paper abutting scale is mounted on the guide portion in such a manner as it can be braked and fixed at two positions due to friction by a fixing means which is pushed against walls of the guide portion.

[0008] A further feature of the present invention is characterized in that, the guide portion is formed with a pair of u-letter grooves (hereinafter referred as "groove") in section or convexes having vertical walls (hereinafter referred as "wall") inside or on both sides, and the fixing means is provided with the pushing plate on the paper abutting scale to be urged to be braked or fixed against the walls in such a manner as to widen the grooves or to clamp the convexes.

[0009] Still further feature of the present invention is characterized in that said fixing means comprises a lever which is inclined on a shaft of the paper abutting scale and by operating the lever the paper abutting scale is pushed and fixed against the wall of the guide member due to the friction.

[0010] Still further feature of the present invention is characterized in that said fixing means comprises a rotary knob to be rotated horizontally on the paper abutting scale with a cam to actuate the push-contacting plate to push against the walls.

[0011] Still further feature of the present invention is characterized in that said guide portions are a pair of convexes, and said two positions are located on both side walls of one convex.

[0012] Still further feature of the present invention is characterized in that said fixing means comprises a rotary knob fixed on the paper abutting scale and a spacer to be fastened arbitrarily on the paper abutting scale to clamp a convex with the push-contacting plate.

[0013] Still further feature of the present invention is characterized in that said fixing means comprises a pushing knob which is pushed down on the paper abutting scale to push the push-contacting plate against the wall.

[0014] Still further feature of the present invention is characterized in that said fixing means comprises a pushing plate within the paper abutting scale so as to be driven to be pushed to the wall.

[0015] Still further feature of the present invention is characterized in that said pushing plate is partially elastic to be biased elastically against the wall.

[0016] Still further feature of the present invention is characterized in that on either one of the fixing means or the wall of the guide portion is provided with a gum. Here, the guide portion of the present invention consists of a pair of grooves, a pair of convexes or one of them, which comprises opposing walls or walls on both sides of each convex. The fixing means for the paper abutting scale is fixed on the guide portion making use of the walls of the groove or convex at the two positions on either two walls.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

Fig. 1 a and Fig. 1 b are the sectional side views of one of the embodiment of a lock mechanism of a paper abutting scale of the present invention.
Fig. 2 a and Fig. 2b are enlarged sectional views of Fig. 1a and the Fig. 1b respectively.
Fig. 3 is a perspective view of a cutter apparatus with the paper abutting scale shown in Fig. 1
Fig. 4 is a partially enlarged plan view of the paper abutting scale shown in Fig. 1.
Fig. 5 is a partially enlarged bottom view of the paper abutting scale shown in Fig. 1 .
Fig. 6 is a side view of a paper abutting scale shown in Fig. 1.
Fig. 7 is a sectional side view of the paper abutting scale of another embodiment.
Fig. 8 is a sectional side view of the locking status of the paper abutting scale shown in Fig. 1.
Fig. 9 is a partially enlarged plan view of the paper abutting scale shown in Fig. 7.
Fig. 10 is a partially enlarged bottom view of the paper abutting scale shown in fig. 7.
Fig. 11 is a side view of the paper abutting scale shown in Fig. 7.
Fig. 12 is a partial plan view of another embodiment of the present invention.
Fig. 13 is a sectional partial side view of the paper abutting scale of Fig. 12.
Fig. 14 is a sectional partial bottom view of the paper abutting scale of Fig. 12.
Fig. 15 is a plan view showing the locked status of the paper abutting scale of of Fig. 12.
Fig. 16 is a sectional partial side view of the paper abutting scale of Fig. 15.
Fig. 17 is a partial bottom view of Fig. 15.
Fig. 18a and Fig. 18b are side sectional views of opening time of the paper abutting scale and locked time respectively.
Fig. 19a and Fig. 19b show the position and the shape of the the pushing plate used for Fig. 18.
Fig. 20 is for showing the pushing knob to be used in Fig. 18.
Fig. 21 is for showing a sectional partial side view of the varied example of the paper abutting scale shown in Fig. 18.
Fig. 22 is a sectional and partial side view of the pushed status of the pushing plate shown in Fig. 21.
Figs. 23a, 23c and Figs. 23b, 23d are sectional side views of the opened time and locked time of the paper abutting scale respectively.
Fig. 24 is a plan view of the pushing member used in Fig. 23.
Fig. 25a and Fig. 25b are sectional side view of the opened time and the locked time.
Fig. 26 is a perspective view of the pushing plate used in Fig. 25.
Fig. 27 is for showing the sectional side view of the varied example of the paper abutting scale of Fig. 25.
Fig. 28 is for showing the sectional side view of the varied example of the paper abutting scale of Fig. 25.

EMBODIMENT

[0018] Hereinafter, the embodiments of the present invention are explained based on the attached drawings.

[0019] It is convenient to control one side of sheets of paper in dimension when arranging the shape of the sheets in order. When exemplifying a paper cutter apparatus 1 shown in Fig. 3, there is provided with a longitudinal paper abutting scale 3 on a square paper putting stand 2, which is adapted to be displaced slidably perpendicular to the cutting direction of the cutter 4 to arrange the paper width of the papers to be cut. For reference, although the paper abutting scale 3 may be made of wood or metal, preferably it is made of synthetic resin which is manufactured easily.

[0020] On the paper putting stand 2, a pair of grooves (a guide portion) 10 are formed in parallel each other and perpendicular to the cutting direction of the cutter 4 and inside of the groove 10 walls 11 are formed on both sides. The paper abutting scale 3 is bridged over two grooves 10 and a pair of leg portions 12 (see Fig. 6) formed on the lower portion of the paper abutting scale 3 are inserted.

[0021] As shown in Fig. 1(a) and Fig. 1(b), in the longitudinal direction of the paper abutting scale 3, outside two leg portions 12, sliding stands 13 to be put on the paper putting stand 2 are formed and each end of pushing plates 14 (biasing means) is put. On the other hand, inside two leg portions 12, push-contacting plates 15 hanging from the ceiling 3a of the paper abutting scale 3 is formed to be able to be pushed against the wall 11 while being hung nearby the bottom of the groove 10, and on the L-letter portion in section of the lowest end of the push-contacting plate 15, the other end of the pushing plate 14 is put (Fig. 5).

[0022] A shaft 16 is mounted on the paper abutting scale 3 above the pushing plate 14 along with the groove direction (see Fig. 2a), a lever 17 which functions as an upper surface of the paper abutting scale 3 are provided rotatably, and on a bearing portion 18 of the lever 17 a rod 19 to drive the pushing plate 14 is formed in a unit.

[0023] Next, the details of every part of the paper abutting scale 3 are explained.

[0024] The dimension of the width of a leg portion 12 is smaller than the width of the groove 10, and it is positioned close to the outer side of the groove bottom so as to make a gap S between it and the push-contacting

plate 15. The push-contacting plate 15 is, as shown in Fig. 2(a), bent in L-letter shape in section at the lowest end thereof so as to be bent at right angle toward separating from the gap S, and as shown in Figs. 4 and 6, upper end surfaces of the paper abutting scale 3 are cut out and the inner sides of the scale 3 are provided with plate stands 3b, where the distal end 17a of the lever 17 (see Fig. 1 (b)) is cut by the dimension of the width of 3b at both sides so as to be rotated. Or, otherwise, without cutting out both sides of the lever, the plate stands 3b are cut allowing the lever 17 to be rotated in. When fixing the paper abutting scale 3 at the given position, first, as shown in Figs. 1 (a) and 2(a), the lever 17 is raised up. Thereby, the rod 19 is rotated to displace the pushing plate 14 from a sliding stand 13 and drive the pushing plate 14 against the push-contacting plate 15 (see Fig. 2(b)). As shown in Fig. 1 (b), the left and right sided push-contacting plates 15 are adapted to be pushed against the walls 11 of the grooves 10, so that the paper abutting scale 3 is adapted to be fixed on the paper putting stand 2, by which an easy positioning of the papers to be cut is carried out.

[0025] Next, another embodiment of the present invention is explained based on Figs. 7-11. For reference, in the following embodiments identical signs are attached to the identical parts and the explains thereof are omitted.

[0026] In the constitution of the paper abutting scale 3 represented by Figs. 7 and 9, there are a pair of convexes 20 (a guide portion) on the paper putting stand 2, and the paper abutting scale 3 is provided with cut-out portions 3c (see Fig. 10) for being coupled with the convex 20. As shown in Fig. 7, the length of the push-contacting plate 15 is changed to reach to the surface of the paper putting stand 2 (see Fig. 11), a leveled portion 13a is formed on the end of the sliding stand 13 so as to keep the position of the driven pushing plate 14 stabilized.

[0027] On the other hand, between two convexes 20, the gaps S between the outside of the convex 20 and extension 3e of the separated from the main body 21 having cut-out 3c are formed on outer sides of the pair of convexes 20 and between two convexes 20 a square cylindrical main body 21 as a main body of the paper abutting scale 3, is provided an spacers 22 are fixed with screws 23 with loose holes displaceably on the main body 21 respectively. The screws 23 are fixed on the upper surface the main body 21 through the loose screw holes 3d.

[0028] Whereby, as shown in Fig. 8, when the levers 17 are operated, the pair of convexes are clamped by the paper abutting scale 3 from outsides.

[0029] Next, the other embodiment is explained based on Figs. 12 - 17. The constitution of this embodiment comprises a rotary knob 24 is provided on the upper surface of the paper abutting scale 3, the operation of which can fix the paper abutting scale 3 to the convex 20 on the paper putting stand 2. In addition, in this case, there is merely one convex. Accordingly, the knob 24 is mounted on merely on one end side of the paper abutting scale 3.

[0030] Accordingly, as shown in Fig. 13, the cut out 3f provided on the coupling member 21A which forms a supporter of the rotary knob 24 and an insert portion of the main body 21A in a unit, further, both walls to clamp the convex 20 are formed with the walls of the push-contacting plate 15 and the spacer 22. Since, only by putting the paper abutting scale 3 on the paper putting stand 2 by coupling the cut out portion 3f with the convex 20, the paper abutting scale is not clamped on the convex 20. Eventually on both sides of the convex 20 the gaps S are generated. So that, as shown in Fig. 14, a cam 26 fixed on the shaft 25 of the knob 24 is divided into 4 sectors (each 90 degree) and three sectors of the four have a cam radius H, which are defined as non-functional and the remaining one sector has radius H+d, which is functional as a cam to push the push-contacting plate 15. Accordingly, when the paper abutting scale 3 is not fastened to the convex 20, the cam 26 contacts to the push-contacting plate 15 and a basic plate 27 with the radius H.

[0031] Therefore, by displacing the paper abutting scale 3 to any position and turning the knob 24 by 90 degrees, the cam 26 is adapted to contact to the push-contacting plate 15 by the distance of H+d. Then, as shown in Figs. 15 - 17, the push-contacting plate 15 pushed by the cam 26 is adapted to clamp the convex 20.

[0032] Next, still another embodiment of the present invention is explained based on Figs. 18 - 20, in which the paper abutting scale 3 is braked on the guide portion by the operation of pushing down of a push button. In this case, a pair of convexes are provided on the paper putting stand 2. As shown in Figs. 18 (a) and 19 (a), the outer shape of the main body 21 of the paper abutting scale 3 is made approximately square cylinder and the upper plate of that cylinder is extended from both ends so as to cover the convexes 20. At the central portion of the paper abutting scale 3 a pushing button 28 is vertically projected from the upper plate while being guided vertically along a guide groove 29 (see Fig. 20) provided on the inner side of the main body 21, and within the main body 21, a pair of contacting plates 30 are inserted slidably to be able to be pushed against the walls of convexes. Further, the lowest end of the push down button 8 and rear ends of the contacting plates are connected each other with arms 31.

[0033] As shown in Fig. 18 (a), the position of a guide pin 32 which connects the push down button 28 and two arms 31 is located above the pin 33 provided on the rear end of the contacting plate 30. Accordingly, when the push down button 28 is pushed down, since the contacting plate 30 has resiliency at the intermediate portion, due to the resiliency, at the time of the arms 31 being horizontally linear like the contacting plate 30 at maximum pressure is pushed against the wall, and even if

the guide pin 32 is passed over the pin 33, the contacting plate 30 is pushed against the wall sufficiently due to the resiliency.

[0034] The contacting plate 30 consists, as shown in 19 (a), of a push-contacting portion 34 pushing against the wall of the convex 20, a spring part 35 to absorb an excessive pushing force, a sliding part 36 which enables the contacting plate 30 to be displaced toward the convex 20 and the connecting part 37 which connects the arm 31.

[0035] Thereby, by merely pushing down the button 28, two contacting plates 30 are extended each toward right and left to be pushed against the walls of the convexes 20 to fix the paper abutting scale 3 on the convex 20 easily.

[0036] Further, due to the resiliency of the contacting plate 30, once the guide pin 32 is passed over the above pin 33, then due to so called an over-center-effect, the button 28 is not free to return back to up-position. Then for releasing the pushed status, just pulling operation of the button 28 is needed.

[0037] Further, in the paper abutting scale 3 represented by Fig. 18, as shown in Fig. 21, a slant portion 38 is provided on the push-contacting portion 34 of the contacting plate 30, at the proximal end of the convex 20 a lateral groove 39 is formed to receive the push-contacting portion 34 and make the slant portion 38 of the push-contacting portion 34 contact against a ceiling portion 40. In addition the length of the arm 31 may be elongated according to the distance to be displaced.

[0038] According to the constitution thus constructed, when pushing the button 28, as shown in Fig. 22, the contacting plate 30 invades in the lateral groove 39 to increase the friction between them, so that the positioning and fixing are secured.

[0039] Further, the other embodiment is explained based on Figs. 23 and 24.

[0040] This paper abutting scale 3 is characterized in that the constitutions of the arm 31 and the contacting plate 30 which constitutes a pushing member 41 are provided in a unit, which is made of the resin.

[0041] The guide pin 32 on the lowest end of the button 28 is penetrated with the bearing 43 of an arm portion 42 of the pushing member 41, and since the pair of pushing members 41 are provided right and left, the shape of the bearing 43 is formed in a symmetry as shown in Fig. 24. The arm portion 42 and the contacting plate portion 44 are connected through a hinge portion 45 and the contacting plate portion 44 is provided with a spring portion 44a and a push portion 44b.

[0042] As to the push portion 44b, Fig. 23 (a) and Fig. 23 (b) are first explained and as its variation example Fig. 23 (c) and Fig. 23 (d) are next explained.

[0043] The push portion 44b indicated in Fig. 23 (a) comprises a vertical surface 44c and a slant surface 44d which contact with the ceiling 40 of the lateral groove 39 of the convex 20. Thereby, as shown in Fig. 23 (b), by pushing down the button28, the paper abutting scale 3 is fixed firmly.

[0044] In addition, as shown in Fig. 23 (c), in the case where the wall of the convex 20 is formed merely by a vertical face, the face of the push portion 44b which contacts to the wall becomes a vertical face 44c, so that, as shown in Fig. 23(d), the whole of the push portion 44b is pushed and the paper abutting scale 3 is fixed.

[0045] Next, a case where a pair of convexes 20 are provided on the paper putting stand 2 and the paper abutting scale 3 is fixed on one convex 20 only is explained based on Figs. 25 and 26.

[0046] In the paper abutting scale 3 shown in Fig. 25, as well as in Fig. 7, there is the lever 17 which comprises the rod 19 for driving the pushing plate 14, which is provided on the bearing portion 18 of the lever 17. Further, a plain portion 13a is formed on the end of the sliding stand 13, which may stabilize the pushing plate 14 thereon when being pushed in the given position.

[0047] And, further, as shown in Fig. 25 (a), the supporting member 46 of the lever 17 and the spacer 22 are connected, and the spacer 22 is inserted in the square cylinder-like main body 21 slidably due to loose screw holes 3d and screws 23. The square cylinder-like main body 21 is hooked on the other convex 20 (not shown).

[0048] The pushing plate 14 is, as shown in Fig. 26, provided with an aperture 14a near to the distal end in such a manner as it is positioned perpendicular to the pushing direction, so that the connection portions 14b of the pushing plate 14 have resiliency. Thereby, the pushing plate 14 pushes the convex resiliently. In addition, the distal end portion of the pushing plate 14 is cut thin. According to the above constitution, when the lever 17 is laid down, as shown in Fig. 25 (b), the push-contacting plate 15 is pushed by the pushing plate 14, and since the main body 21 is hooked by the other convex 20, the spacer 22 is protruded from the main body 21 by the gap S to contact to the convex 20, thereby, the convex 20 is clamped with the push-contacting plate 15 and the spacer 22 to fix the paper abutting scale 3 on the convex 20. Then, an excessive pushing stroke of the pushing plate 14 is absorbed by the resiliency of the connection portions 14b of the pushing plate 14.

[0049] Next, a variation example of the paper abutting scale 3 shown in Fig. 25 is explained based on Figs. 27 and 28.

[0050] In Fig. 27, what is different from Fig. 25 resides in that on the wall of the spacer 22 an extruded portion 22 a having a slant is provided and the lateral groove 39 having a slant ceiling is provided at the proximal end of the convex 20 which is opposing to the spacer 22. Thereby, when the lever 17 is laid down, the extruded portion 22a of the spacer 22 is cut in the groove 39 of the convex 20 to secure the fixing of the paper abutting scale.

[0051] What is different in Fig. 28 resides in that on the wall of the spacer 22 a rubber sheet 47 is attached. Accordingly, an excessive force at the time of clamping

is absorbed by the rubber sheet 4, so that the pushing plate 14 can be used without the aperture 14a.

[0052] As mentioned above, according to the present invention, the following effects are obtained. The paper abutting scale can be fixed by a simple and one-touch operation (a lever, knob or button) of the lock mechanism due to friction at two desired portions of the guide portion, so that, a paper cutting operation can be carried out in a short time.

[0053] Since the guide portions are formed with the pair of grooves or convexes, the braking or fixing of the paper abutting can be carried out by a simple operation.

Claims

1. A lock mechanism for paper abutting scale in a paper cutter characterized in that, on a paper putting stand, guide portion perpendicular to the cutting direction of a cutter is provided, a paper abutting scale is provided so as to be braked or stopped by a fixing means at two arbitrary positions on the guide portion.

2. A lock mechanism for paper abutting scale in a paper cutter according to claim 1, wherein the guide portion is a pair of sectional U-letter grooves disposed in parallel each other.

3. A lock mechanism for paper abutting scale according to claim 1, wherein the guide portions is a pair of parallel convexes.

4. A lock mechanism for paper abutting scale in a paper cutter according to claim 1, wherein the fixing means comprises a lever to be inclined on the paper abutting scale and a push-contacting plate to be pushed against the guide portion by the operation of the lever.

5. A lock mechanism for paper abutting scale in a paper cutter according to claim 1, wherein the fixing means comprises a rotary knob turnable horizontally and having a cam to push a push-contact plate against vertical walls of the guide portion.

6. A lock mechanism for paper abutting scale in a paper cutter according to claim 3, wherein the two positions are located on both sides of one convex.

7. A lock mechanism for paper abutting scale in a paper cutter according to claim 4, wherein the fixing means comprises a supporting member to support the lever and a spacer fastened on a paper abutting main body located between the guide portion and connected to the supporting member.

8. A lock mechanism for paper abutting scale in a paper cutter according to claim 1, wherein the fixing means comprises a button to be pushed from the above in order to push the push-contacting plate against the vertical wall of the guide portion.

9. A lock mechanism for paper abutting scale in a paper cutter according to claim 1, wherein the fizing means comprises a contacting plate to push the push-contacting plate against the wall of the guide portion, thereby to fix the paper abutting scale indirectly.

10. A clock mechanism for paper abutting scale in a paper cutter according to claim 9, wherein the contacting plate has resiliency.

11. A clock mechanism for paper abutting scale in a paper cutter according to claim 9, wherein the fixing mechanism comprises further a lateral groove at the proximal of the convex, and a slant provided on the distal end of the contacting plate and to engage with the groove.

12. A lock mechanism for paper abutting scale in a paper cutter according to claim 1, wherein a gum is interposed between the fixing means and the wall of the guide portion.

FIG.1(a)

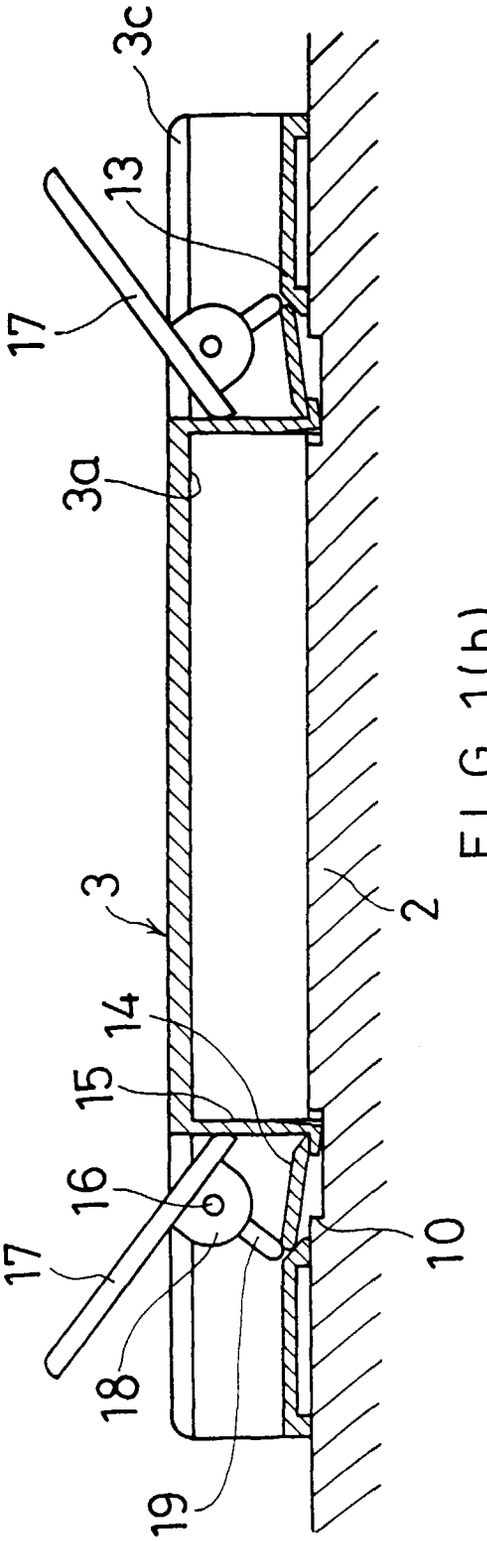


FIG.1(b)

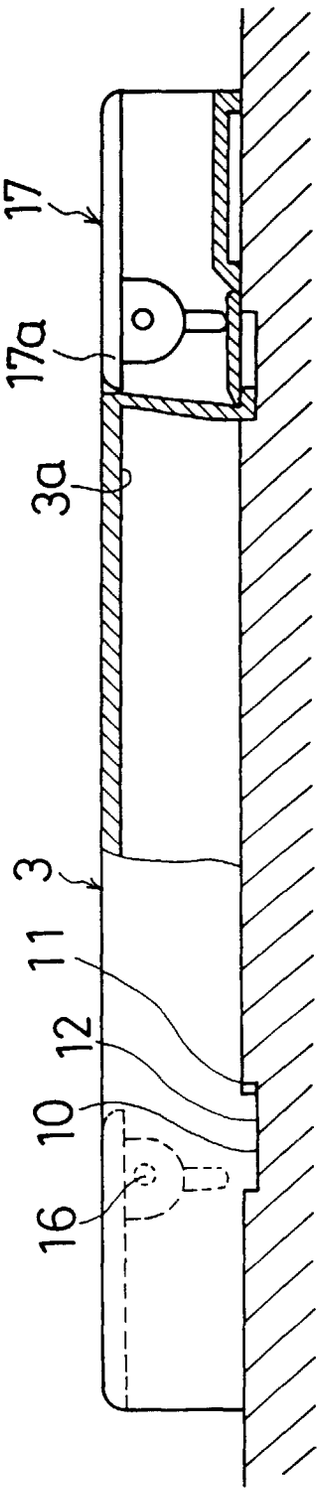


FIG.2(a)

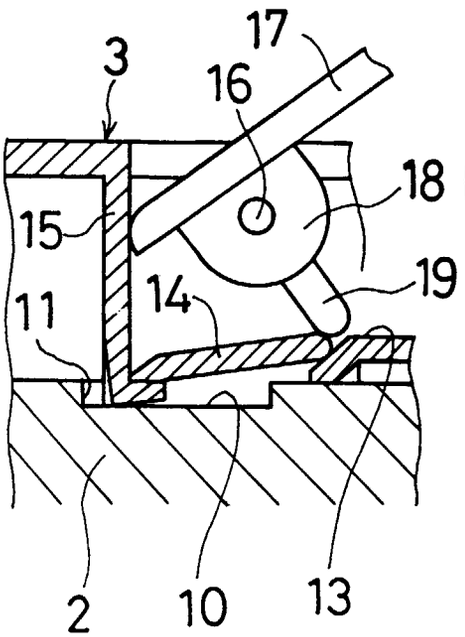


FIG.2(b)

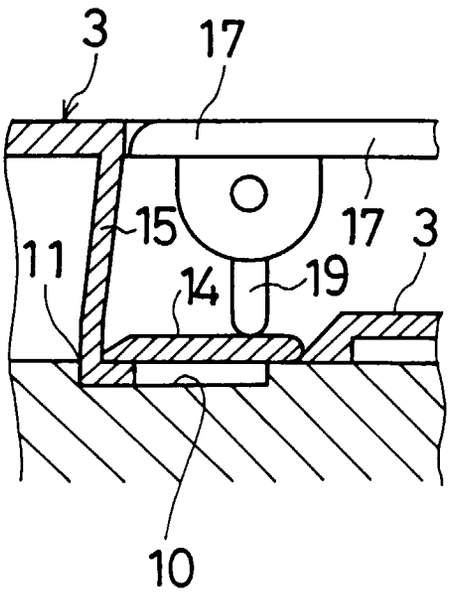


FIG.3

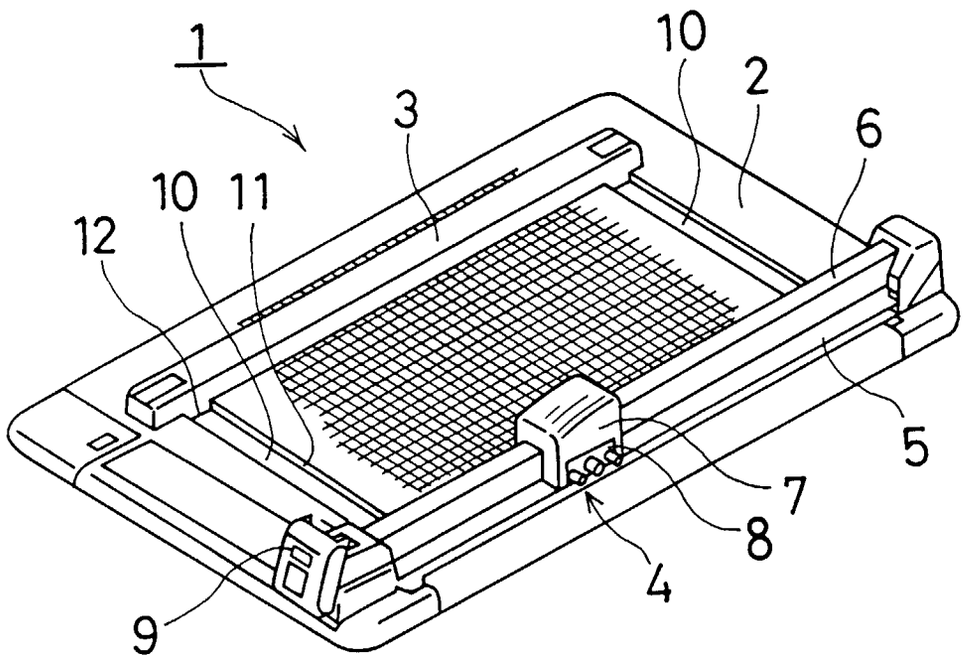


FIG. 4

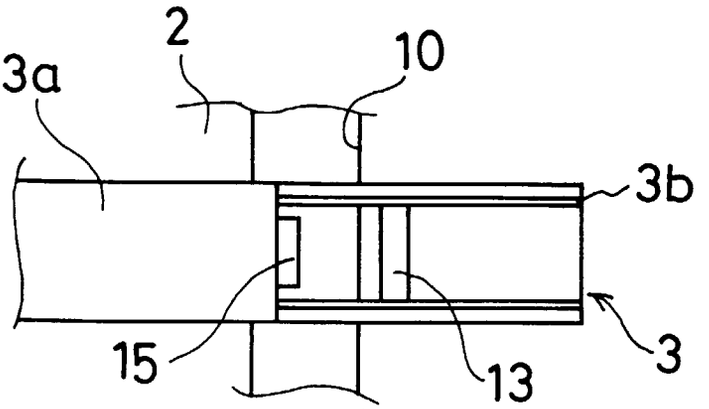


FIG. 5

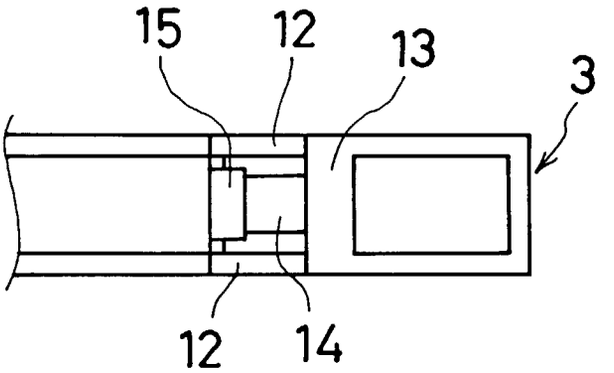


FIG. 6

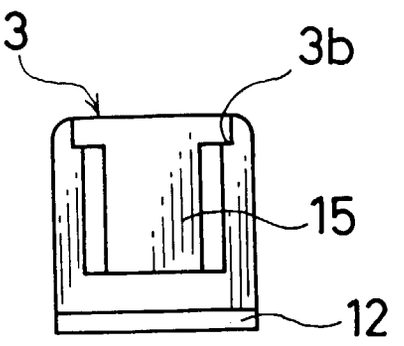


FIG.7

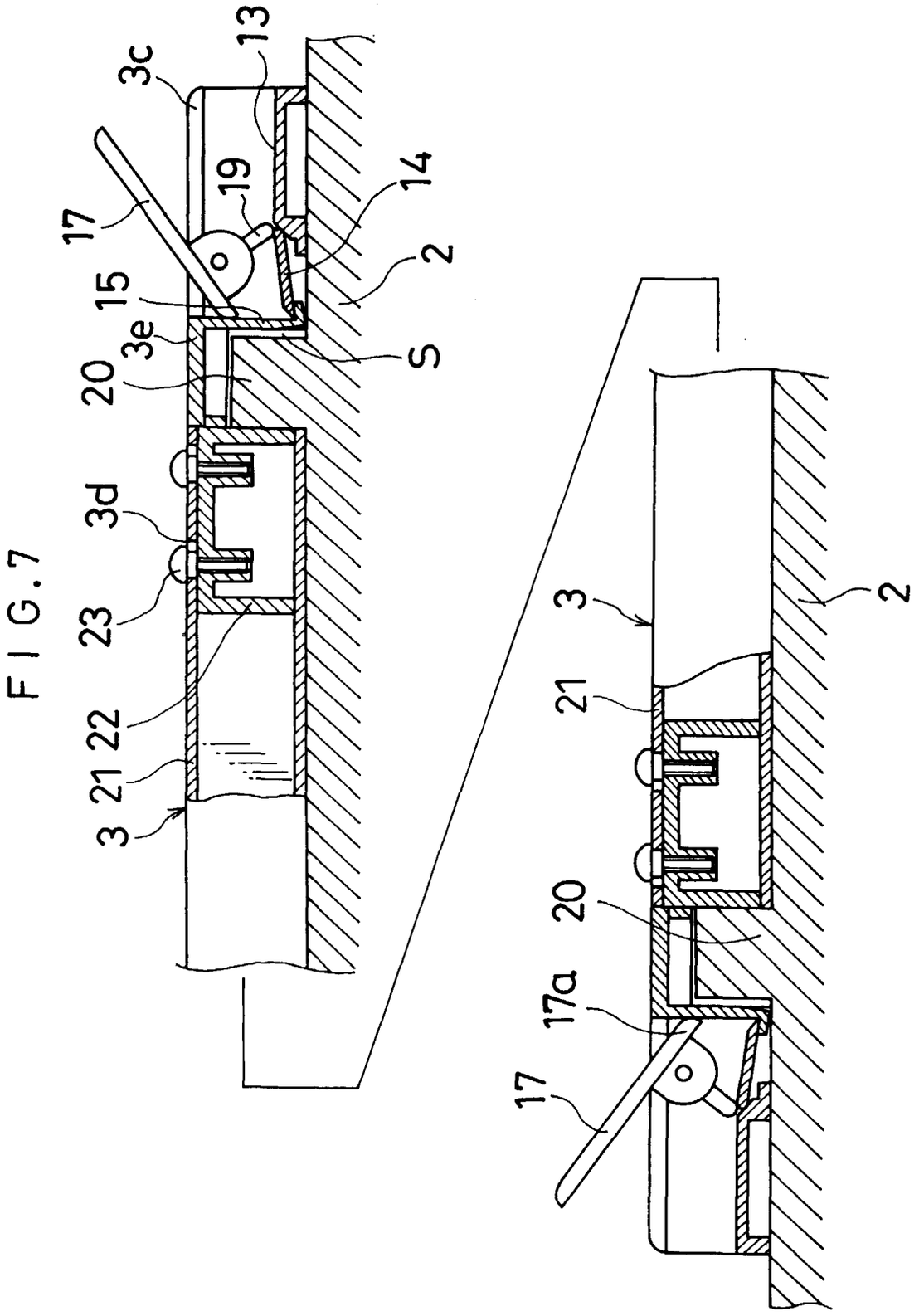


FIG.8

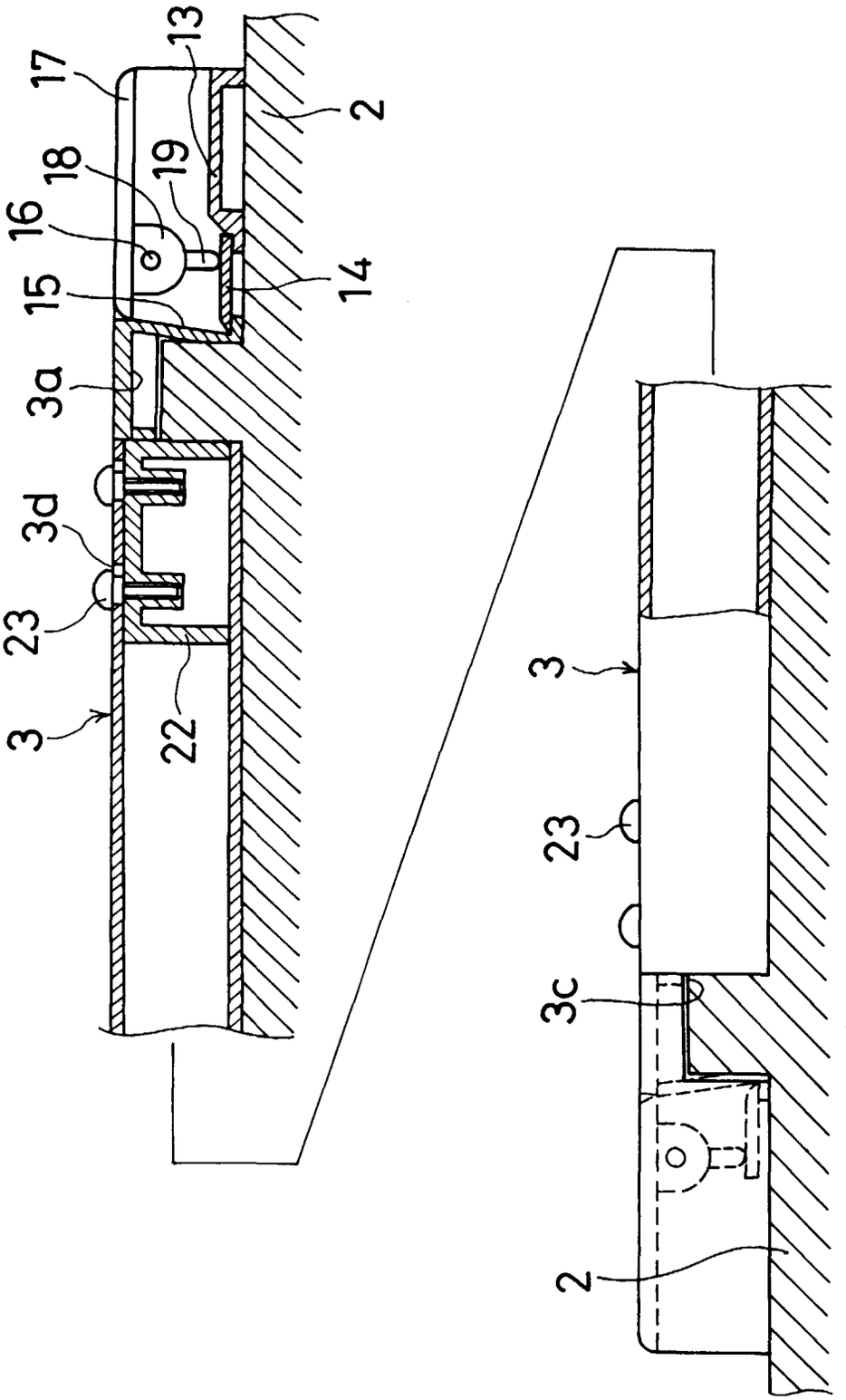


FIG. 9

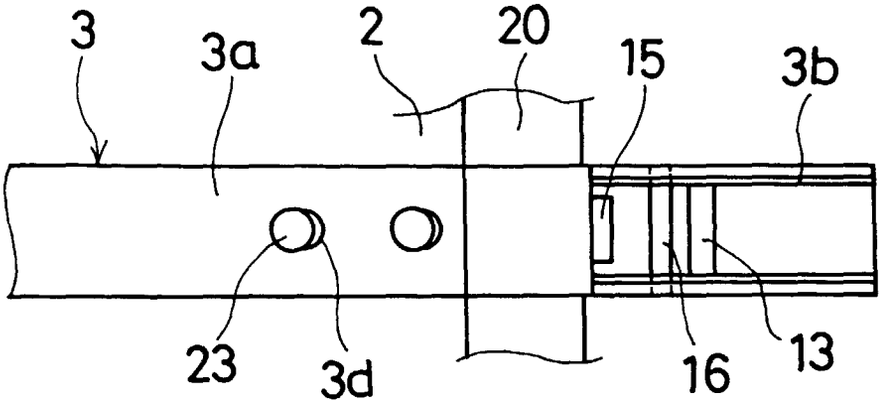


FIG. 10

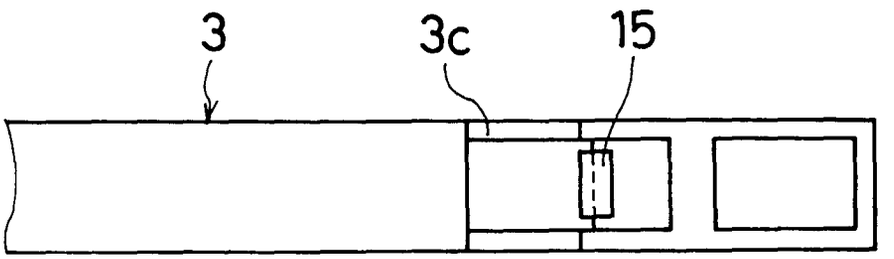


FIG. 11

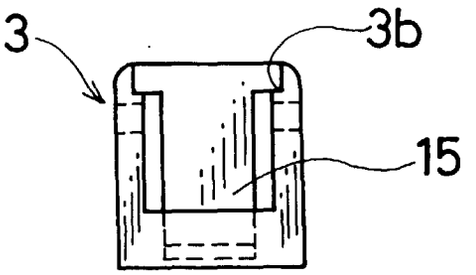


FIG.12

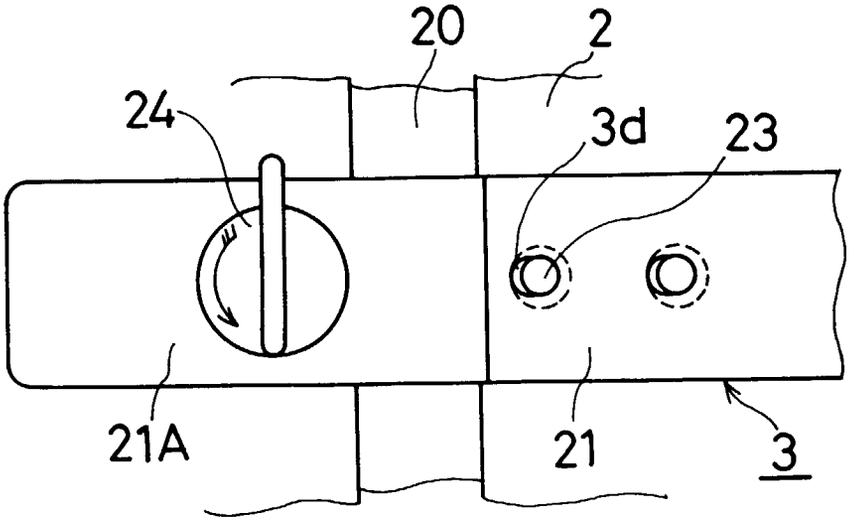


FIG.13

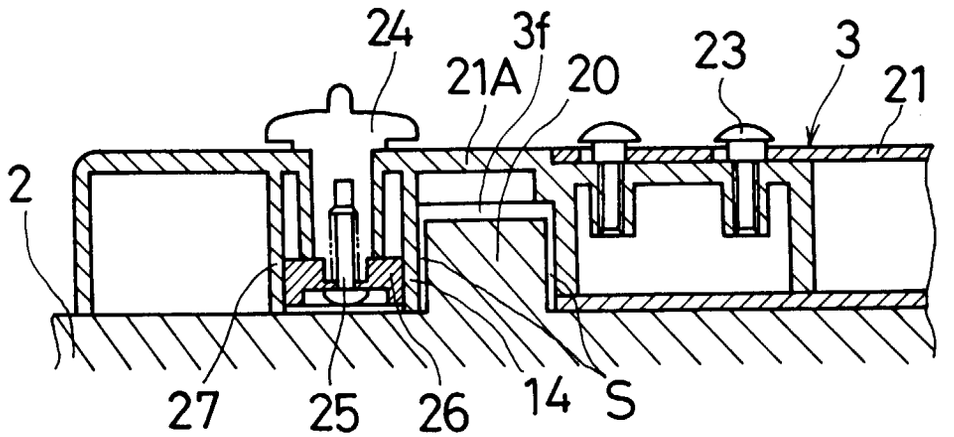


FIG.14

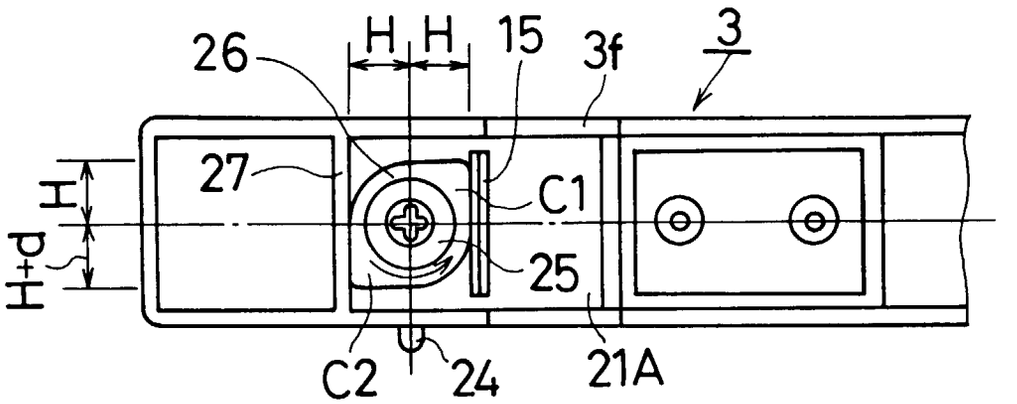


FIG.15

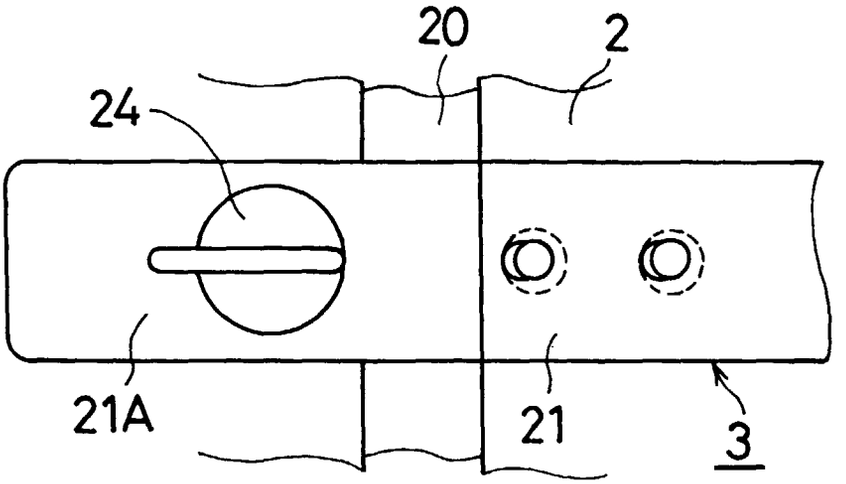


FIG.16

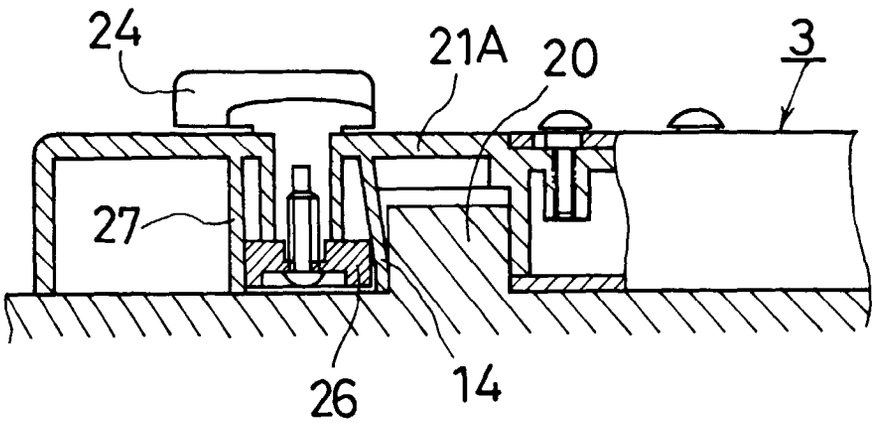


FIG.17

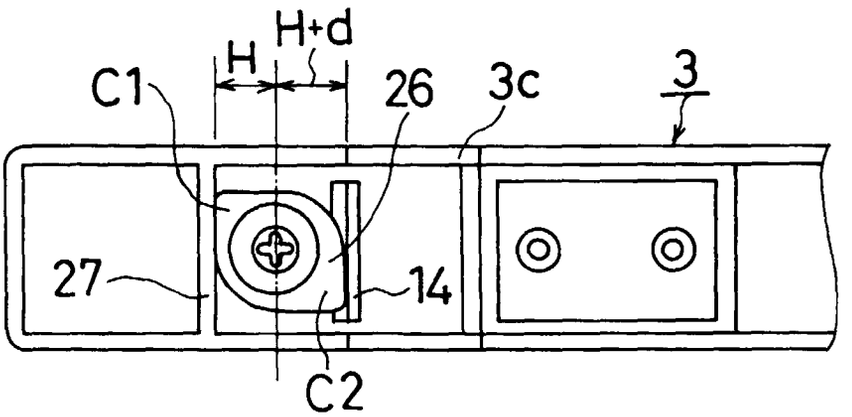


FIG.18(a)

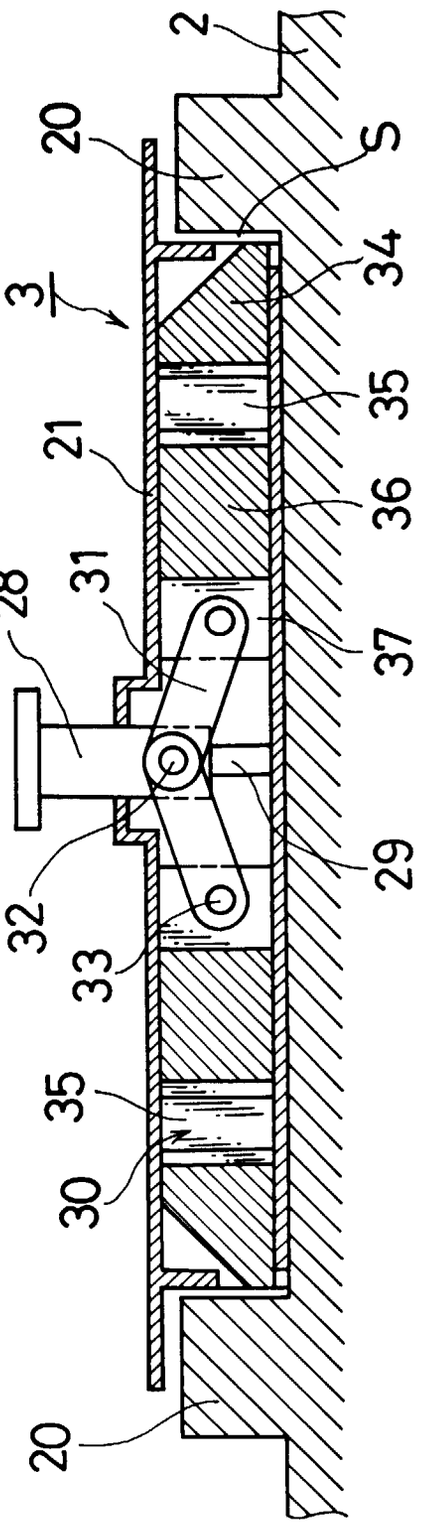


FIG.18(b)

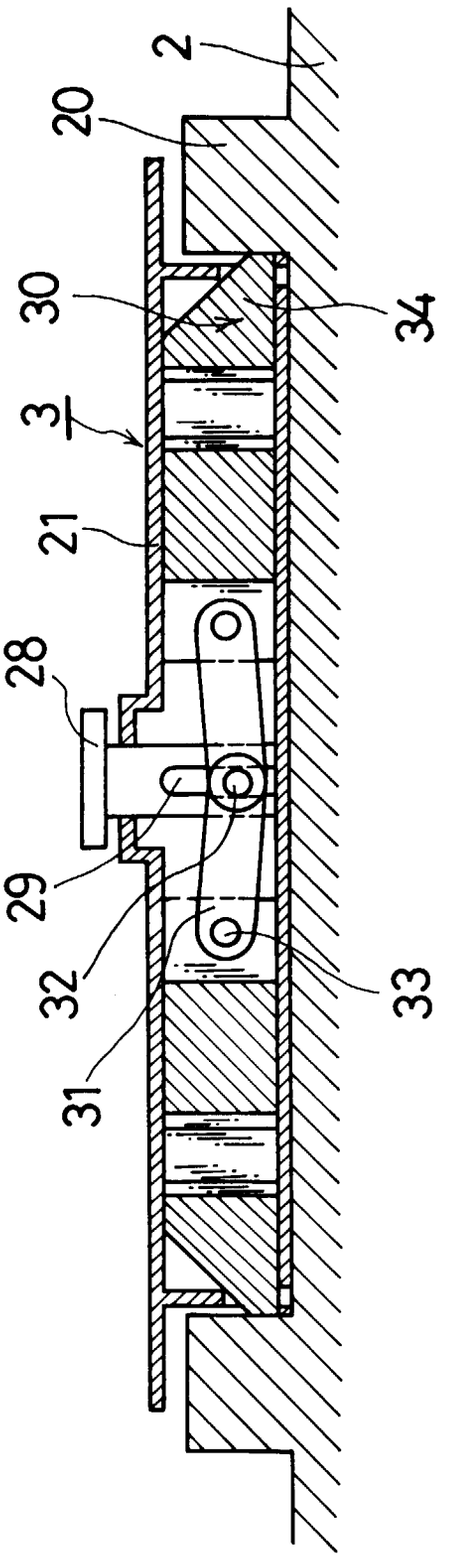


FIG. 19(a)

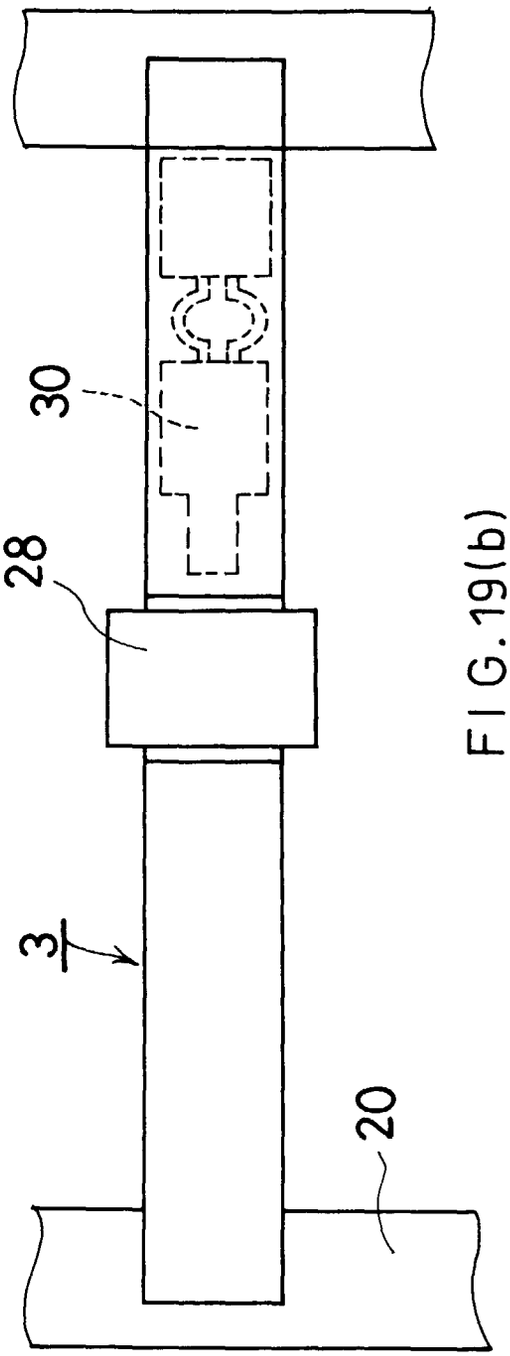


FIG. 19(b)

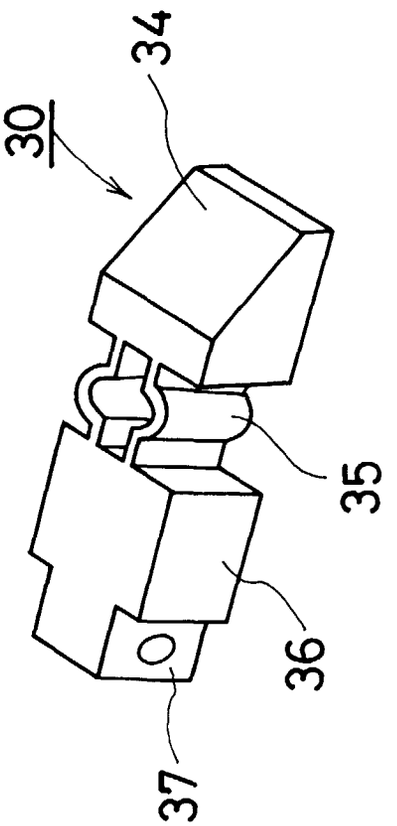


FIG. 20

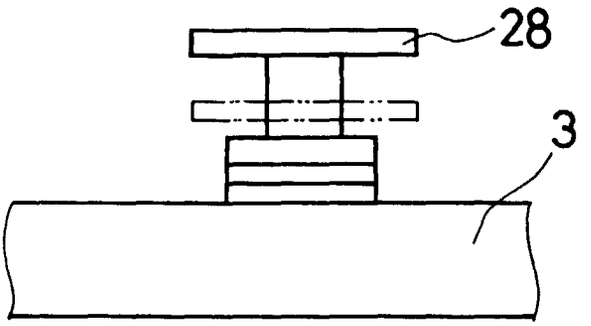


FIG. 21

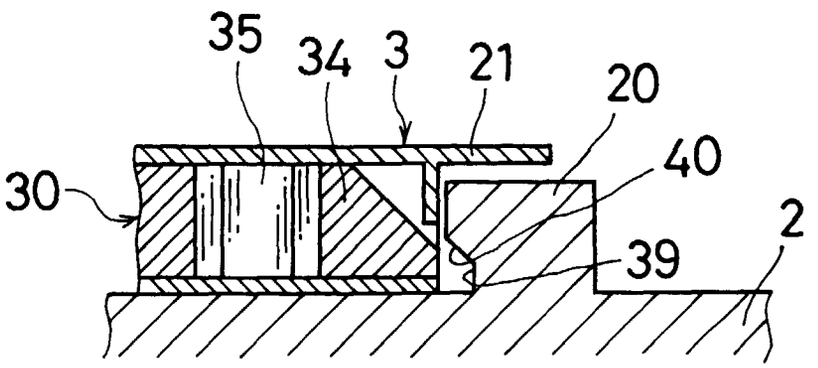
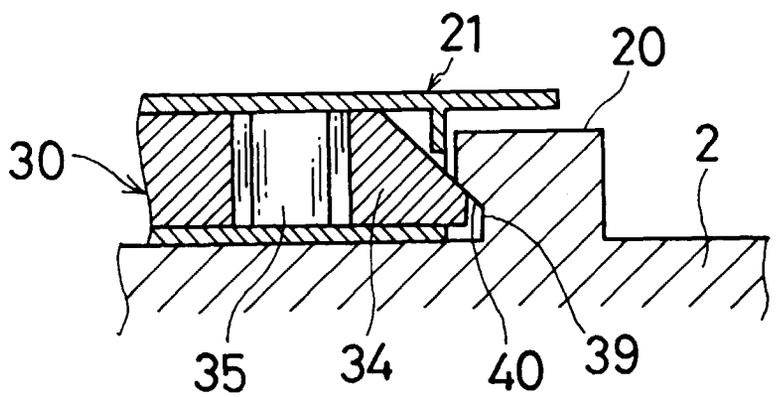


FIG. 22



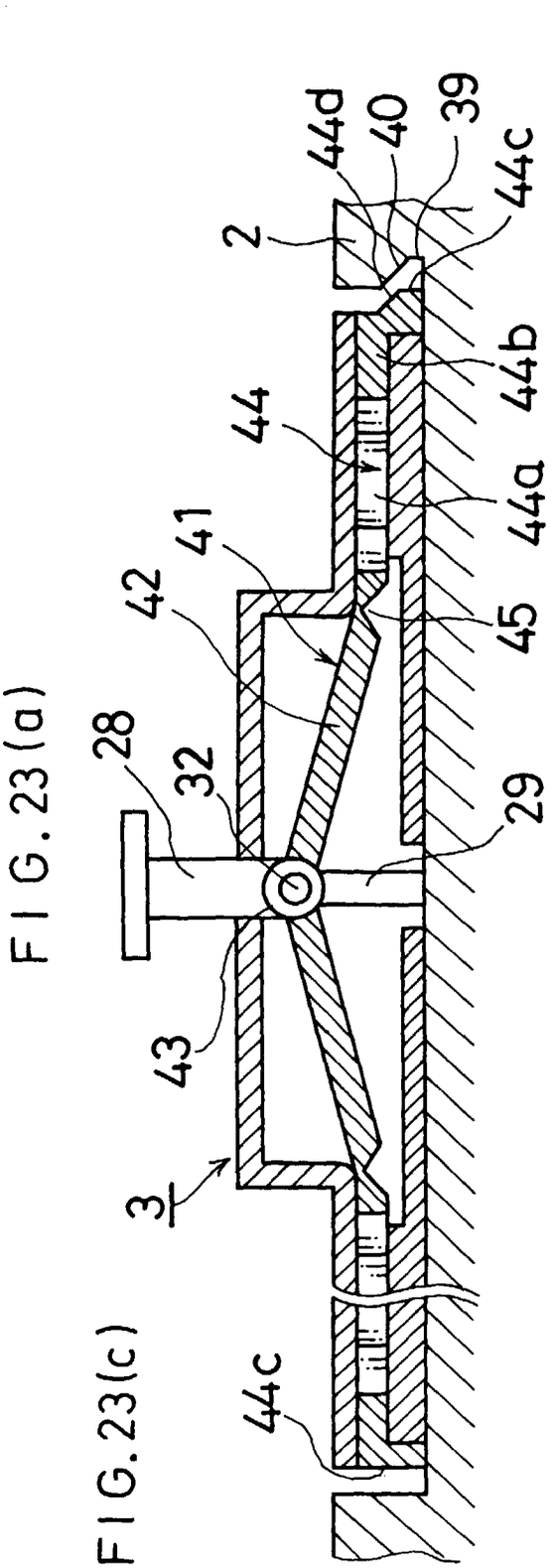


FIG. 23(a)

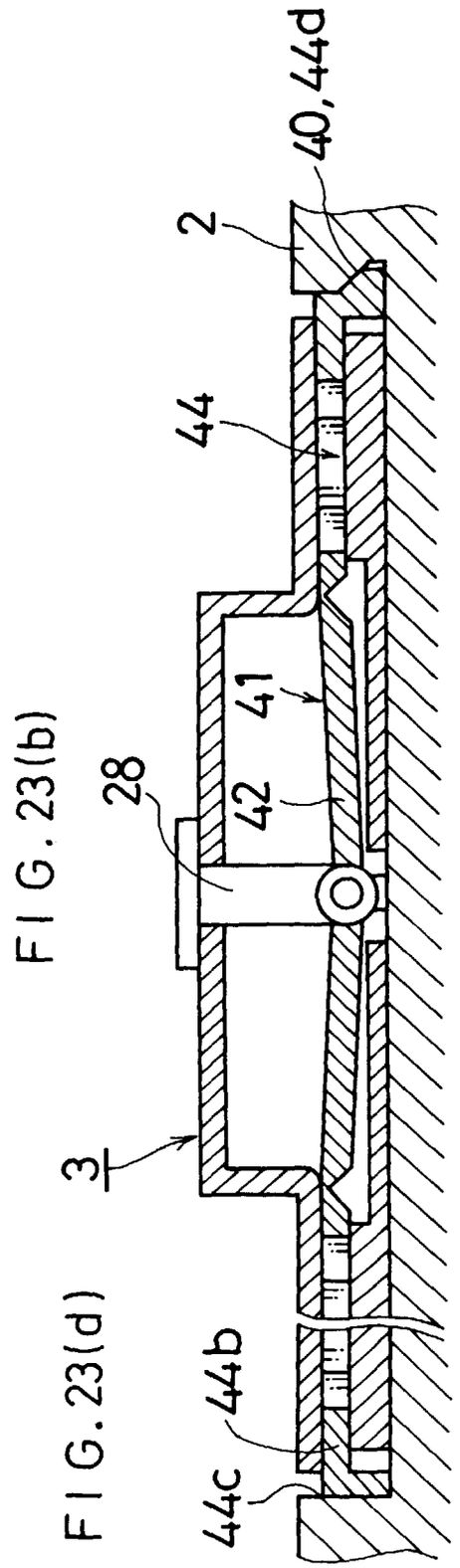


FIG. 23(b)

FIG. 23(c)

FIG. 23(d)

FIG.24

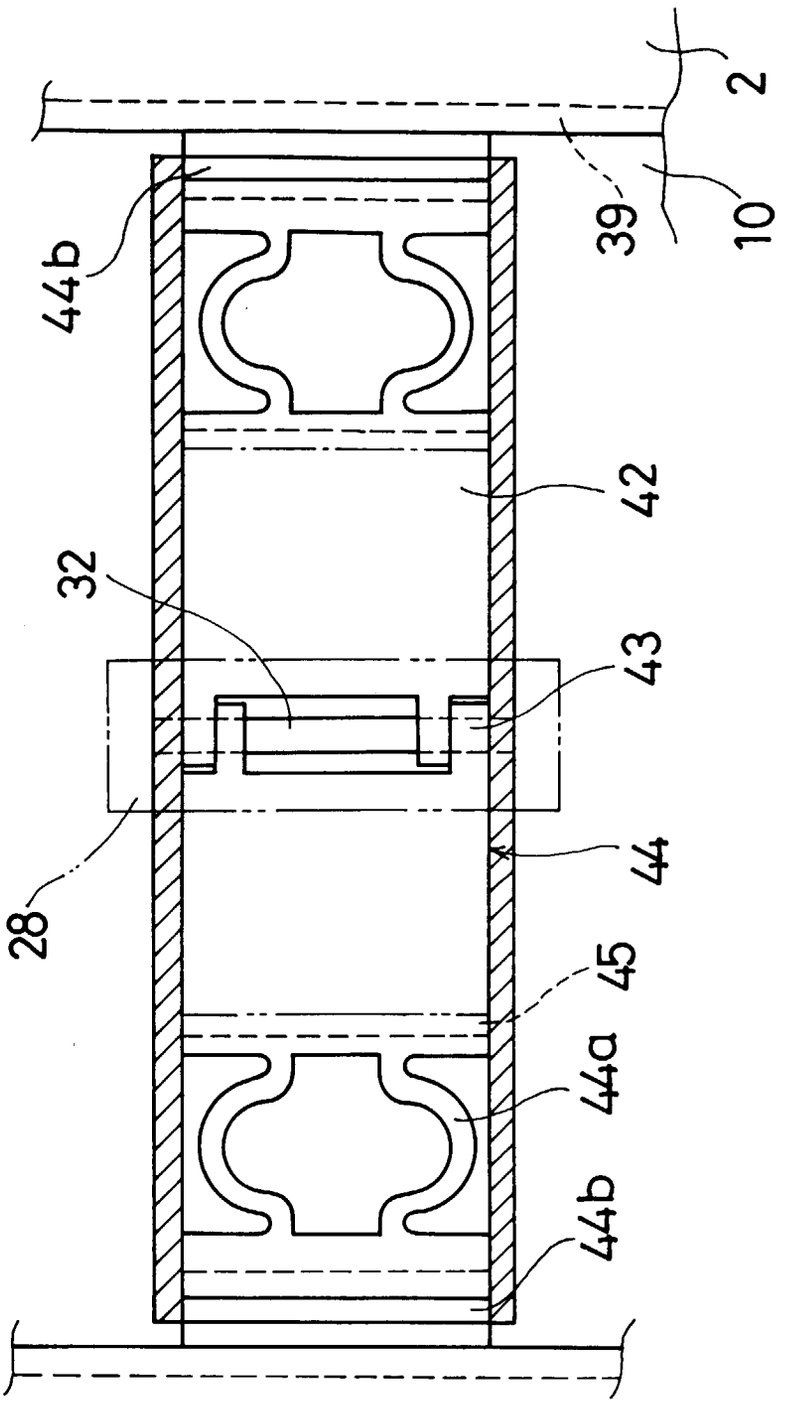


FIG. 25(a)

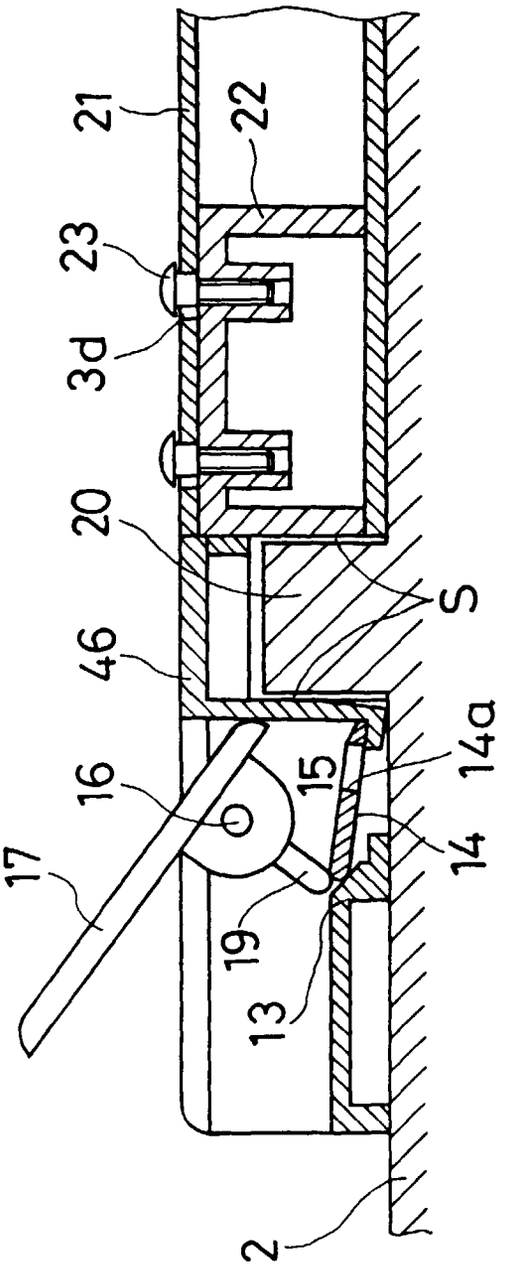


FIG. 25(b)

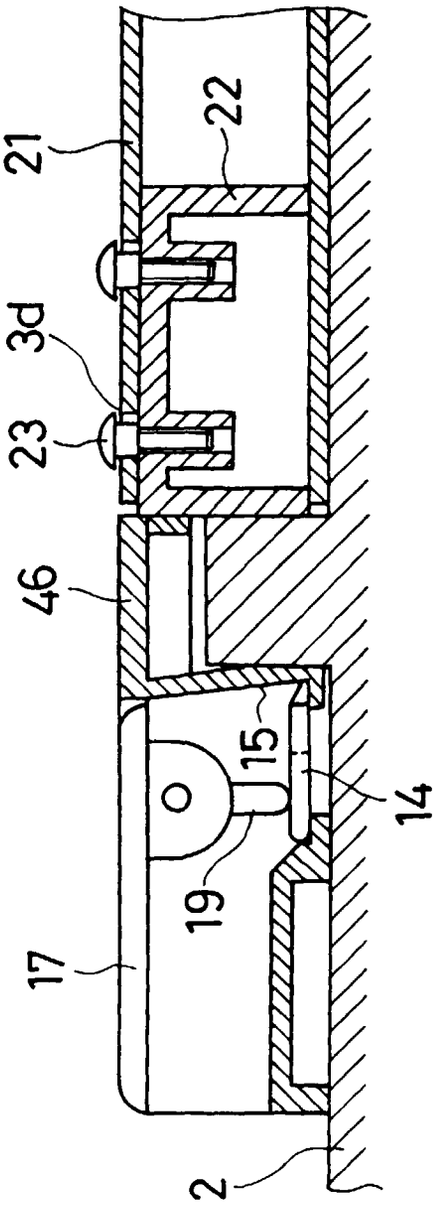


FIG. 26

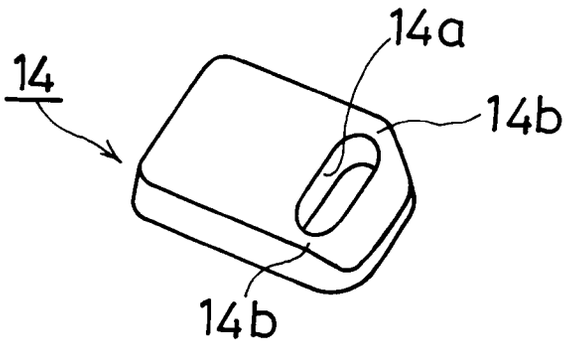


FIG. 27

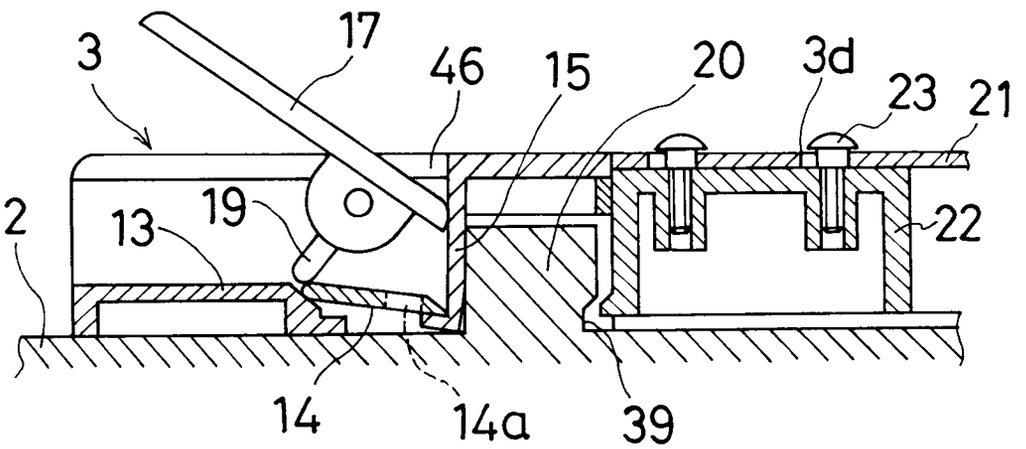


FIG. 28