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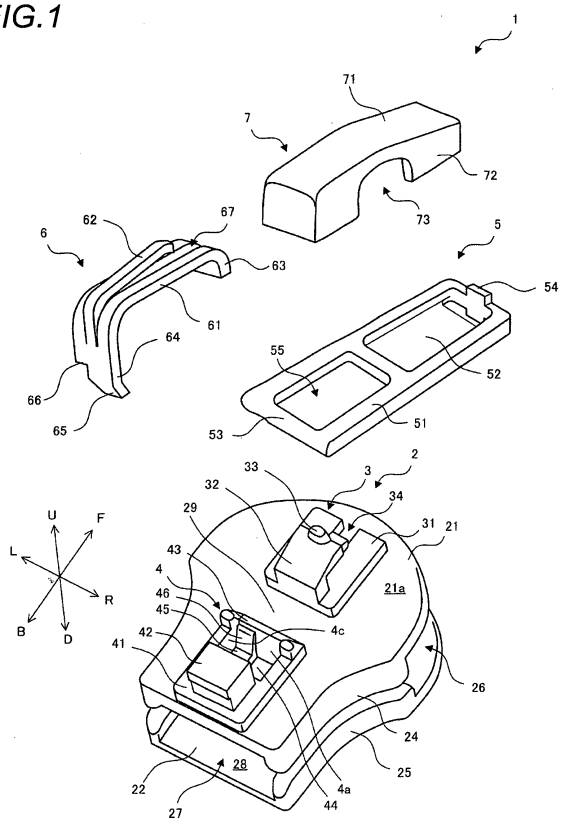
# (54) SLIDER FOR SLIDE FASTENER

(57) [Problem] To provide a slider for a slide fastener which has a rigid stop function and moves smoothly.

[Solution] A slider (1) for a slide fastener characterized in that: the slider (1) is provided with a trunk (2) which is formed by coupling an upper wing plate (21) and a lower wing plate (22) with a guide post (23) and which has a guide groove (28) between the upper and lower wing plates (22 and 23), a stop claw body (6) which has one side with a locking portion (63) which is locked onto the trunk (2) and another side with a claw portion (64) which moves relative to the trunk (2), and a pull tab (5) which is placed on the trunk (2) and is capable of moving the claw portion (64); the trunk (2) has an attaching portion (3) which is provided on the guide post (23) side of the top surface (21a) of the upper wing plate (21) and locks the locking portion (63), a claw hole (44) which is provided on the top surface (21a) of the upper wing plate (21) on the opposite side from the guide post (23), communicates with the guide groove (28), and receives the claw portion (64), and a placement portion (29) on which the pull tab (5) is placed between the attaching portion (3) and the claw hole (44); and the stop claw body (6) and/or the claw hole (44) has a projecting portion (46 and 68) formed at a respective abutting position, the abutting position being above the edge part of the guide groove (28) side of the claw hole (44).

*FIG.1*

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## Description

### Technical Field

**[0001]** The present invention relates a slider for slide fastener, used, for example, in a slide fastener having an automatic stop mechanism.

### Background Art

**[0002]** Conventionally, a slider for a slide fastener having an automatic stop mechanism is known (see Patent Document 1). The slider for slide fastener, described in Patent Document 1 is configured so that a spring is arranged to be moved on a body thereof along a front and rear direction, a stopping claw is also arranged to be moved in a claw hole along the front and rear direction and a rigid stop function is provided as the stopping claw is moved in the front direction to come in close contact with a frown wall surface of the claw hole.

### Prior Art Document

### Patent Document

**[0003]** Patent Document 1: Japanese Patent Application Publication No. H10-127313

### Summary of Invention

### Problems to Be Solved by Invention

**[0004]** However, when the slider 1 is switched from a stopped state to a movable state, an operator attempts to lift a pull tab 5 and in turn lift a claw portion 64 so that the claw portion 64 escapes from between elements 100, and as a result, as shown in Fig. 12, the stopping claw body 6, which is in close contact with the front wall surface 4a of the claw hole 44, is likely to be subjected to a large force exerted thereon in a direction in which the stopping claw body 6 is forced to come in further close contact with the front wall surface. In this case, there is a possibility that the claw portion 64 is immovably sandwiched between the wall surface 4a of the claw hole 44 and the elements 100 and also the claw portion 64 is excessively bitten by the elements 100 so that the claw portion 64 is not smoothly lifted and thus movement of the slider 1 is difficult.

**[0005]** An object of the present invention is to provide a side fastener slider which can have a rigid stop function and can be smoothly operated.

### Means for Solving Problems

**[0006]** According to one embodiment of the present invention, there is provided a slider for slide fastener, including: a body having upper and lower blades connected by a guide post and a guide groove between the upper and lower blades; a stopping claw body having, at one side thereof, a locking portion locked on the body and, at the other side, a claw portion movable relative to the body; and a pull tab mounted on the body and capable of moving the claw portion; wherein the body includes: an attaching portion provided on an upper surface of the upper blade at a side of the guide post, and configured to lock the locking portion; a claw hole provided on the upper surface of the upper blade at a side opposite to the guide post, and communicated with the guide groove to allow the claw portion to be inserted therethrough; and a mounting portion provided between the attaching portion and the claw hole to allow the pull tab to be mounted thereon; wherein at least one of the stopping claw body and the claw hole is formed with a protrusion at a location where the stopping claw body and the claw hole are abutted against each other, and wherein the abutted location is located above an edge portion of the claw hole at a side of the guide groove.

**[0007]** In the slider for slide fastener according to one embodiment of the present invention, the protrusion is formed on a wall surface of the claw hole at a side of the guide post, and the protrusion protrudes in a direction opposite to the guide post.

**[0008]** In the slider for slide fastener according to one embodiment of the present invention, a bottom portion is provided in a part of the claw hole, and the stopping claw body has a notch portion provided in a part of the claw portion and capable of being abutted against the bottom portion.

**[0009]** In the slider for slide fastener according to one embodiment of the present invention, the notch portion is abutted against the protrusion.

**[0010]** In the slider for slide fastener according to one embodiment of the present invention, the protrusion is formed to extend upward in a vertical direction to the bottom portion.

### Advantageous Effects of Invention

**[0011]** According to one embodiment of the present invention, a side fastener slider can be provided which can have a rigid stop function and can be smoothly operated.

### Brief Description of Drawings

**[0012]**

Fig. 1 is an exploded perspective view of a slider 1 of a first embodiment.

Fig. 2 is an exploded sectional view of the slider 1 of the first embodiment.

Fig. 3 is a sectional view as viewed from a direction of an arrow III-III of Fig. 2.

Fig. 4 is a sectional view of the slider 1 of the first embodiment after assembling.

Fig. 5 is a sectional view taken through a claw hole

44 in a locked state of the slider 1 of the first embodiment.

Fig. 6 is a sectional view taken through a bottom portion 45 in a locked state of the slider 1 of the first embodiment.

Fig. 7 is a sectional view taken through the claw hole 44 in a moving state of the slider 1 of the first embodiment.

Fig. 8 is a view showing a stopping claw body 6 of a slider 1 of a second embodiment.

Fig. 9 is a sectional view taken through a claw hole 44 in a locked state of the slider 1 of the second embodiment.

Fig 10 is a view showing a bottom portion 45 of a slider 1 of an alternative embodiment.

Fig. 11 is a view showing a slider 1 of an alternative embodiment.

Fig. 12 is a view showing a conventional slider 1.

## Embodiments of Invention

**[0013]** Hereinafter, a slider 1 used for a slide fastener will be described in detail by way of example with reference to the accompanying drawings.

**[0014]** Fig. 1 is an exploded perspective view of a slider 1 of a first embodiment. Fig. 2 is an exploded sectional view of the slider 1 of the first embodiment. Fig. 3 is a sectional view as viewed from a direction of an arrow III-III of Fig. 2. Meanwhile, for all following embodiments, as shown in Fig. 1, an arrow U refers to an upward direction, an arrow D refers to a downward direction, an arrow F refers to a front direction, an arrow B refers to a rear direction, an arrow L refers to a left direction and an arrow R refers to a right direction.

**[0015]** In addition, the slider 1 is intended to be equipped on a slide fastener and is used to engage and disengage fastener elements provided on a pair of right and left fastener chains not shown. The fastener chains are constructed by attaching a plurality of individual fastener elements, which are made of metal or thermoplastic resin, on woven knitted fastener tapes in a row shape, or by stitching continuous fastener elements, which are formed in a coil or zigzag shape, on the respective fastener tapes.

**[0016]** The slide fastener is configured so that the fastener elements of the right and left fastener chains are engaged with each other by moving the slider 1 in a front direction along the arrow F and are disengaged from each other by moving the slider 1 in a rear direction along the arrow B. Herein, the front and rear direction (F-B direction) also corresponds to a tape length direction of the fastener tapes, and a right and left direction (R-L direction) along the arrows R and L is a direction parallel to upper and lower blades 21 and 22 of a body 2 of the slider 1, as described below, and also perpendicular to the front and rear direction. In addition, an upward and downward direction (U-D direction) along the arrows U and D is a direction perpendicular to the upper and lower blades 21 and 22 and is also referred to as a front and back direction.

**[0017]** As shown in Fig. 1, the slider 1 for slide fastener, having an automatic stop mechanism according to the first embodiment is assembled of four members, i.e., a body 2, a pull tab 5, a stopping claw body 6 and a cover 7. The body 2, the pull tab 5 and the cover 7 are preferably molded by die-casting metals, such as aluminum alloy or zinc alloy. Also, the stopping claw body 6 and the cover 7 may be formed by pressing metal plates.

**[0018]** The body 2 of the slider 1 is constituted of an upper blade 21, a lower blade 22 and a guide post 23 connecting a front F side of the upper blade 21 with the a front F side of the lower blade 22. On right and left side edges of the upper and lower blades 21 and 22 located on a rear B side thereof, upper blade flanges 24 and lower blade flanges 25 for guiding fastener elements, not shown, are respectively formed to protrude from right and left side edges of the upper and lower blades 21 and 22 located on a rear B side thereof. The upper blade flanges 24 and the lower blade flanges 25 are formed to face each other and thus to protrude in directions approaching each other. Between the upper and lower blades 21 and 22 of the body 2, shoulder mouths 26 are formed on both right and left sides of the guide post 23 at the front side of the body 2, a rear mouth 27 is formed at a rear end of the body 2, and also a guide groove 28 for guiding fastener elements, not shown, is formed to communicate the shoulder mouths 26 with the rear mouth 27.

**[0019]** The slider 1 of the first embodiment can be applied to a fastener chain having individual elements attached on both surfaces of a fastener tape, a fastener chain having a linear fastener element bent in a zigzag shape and attached on a fastener tape, or the like. Also, in a case of a fastener chain having a linear fastener element wound in a coil shape and attached on a fastener tape, a slider 1 in which flanges are be provided on only either one of the upper and lower blades 21 and 22 to guide the fastener elements may be applied thereto.

**[0020]** On an upper surface 21a of the upper blade 21 of the body 2, first and second attaching portions 3 and 4 are respectively erected at the front F and rear B sides thereof to allow the pull tab 5, the stopping claw body 6 and the cover 7 to be attached thereon. Also, a mounting portion 29 configured to allow the pull tab 5 to be rotatably mounted is formed between the first and second attaching portions 3 and 4 of the upper surface 21a.

**[0021]** The first attaching portion 3 is a portion protruding upward U from the front F side of the upper surface 21a of the upper blade 21, which corresponds to one side of the upper surface 21a, and has a first stepped portion 31, an inclined portion 32 and a protrusion 33. Also, the first stepped portion 31 has a recessed portion 34 formed in the vicinity of the middle of a front F side thereof in the right and left direction. The inclined portion 32 is inclined to protrude upward U from the vicinity of the middle of the first stepped portion 31 in the right and left direction and also to descend downward D from front F toward

rear B thereof. The protrusion 33 protrudes upward U from the most front F side of the inclined portion 32.

**[0022]** The second attaching portion 4 is a portion protruding upward U from the rear F side of the upper surface 21a of the upper blade 21, which corresponds to the other side of the upper surface 21a, and has a second stepped portion 41, a post portion 42 and a guide surface 43. Also, the seconds stepped portion 41 has a claw hole 44 formed between the post portion 42 and the guide surface 43 to be recessed downward D relative to the upper surface 21a and to be communicated with the guide groove 28. The post portion 42 protrudes upward U from the second stepped portion 41. The guide surface 43 is inclined to protrude from the second stepped portion 41 in front F of the claw hole 44 and also to descend downward D toward a front F side thereof.

**[0023]** The claw hole 44 is formed to be surrounded by a front wall surface 4a at a front F side thereof, a rear wall surface 4b at a rear B side, a side wall surface 4c at a left L side and a side wall surface 4d at a right R side, which are parallel to each other in the upward and downward direction. On sides of the four wall surfaces 4a, 4b, 4c and 4d at a side of the guide groove 28, the claw hole 44 is communicated with the guide groove and also has a bottom portion 45, which is formed to be integrated with the front wall surface 4a, the side wall surface 4c at the left L side and the rear wall surface 4b, and to be spaced from the side wall surface 4d at the right R side. A space between the bottom portion 45 and the side wall surface 4d at the right R side is a hole portion configured to allow a claw portion 64 of the stopping claw body 6 to be inserted into the guide groove 28.

**[0024]** An in-hole protrusion 46 is formed to integrally extend upward U from the bottom portion 45 in a vertical direction to the bottom portion 45 and also to protrude rearward B from the front wall surface 4a at the front F side. Accordingly, a dimension between the front and rear wall surfaces 4a and 4b is larger than a dimension between the in-hole protrusion 46 and the rear wall surface 4b. Also, a surface of the in-hole protrusion is formed in an inclined shape so that the dimension between the in-hole protrusion 46 and the rear wall surface 4b is gradually increased as it goes from the bottom portion 45 upward. The in-hole protrusion 46 is preferably formed to have a dimension in the right and left direction equal to or smaller than that of the bottom portion 45. Accordingly, when the stopping claw body 6, as described below, is assembled on the body 2, a gap is created between the front wall surface 4a of the claw hole 44 and a leading end of the claw portion 64, so that a collision between the front wall surface 4a and the leading end of the claw portion 64 is hardly occurred and thus assembling can be facilitated. Meanwhile, the in-hole protrusion 46 constitutes a protrusion according to the present invention.

**[0025]** The pull tab 5 has a pull tab main body 51 and a handle portion 52. The pull tab main body 51 is of a rectangular shape and has a pivot 53 formed at one side in a longitudinal direction thereof and serving as a rotational center to the body 2, and small projections 54 formed on front and back sides of a leading end at the other side. On a region of the pull tab main body 51 at a side of the pivot 53, a hole portion 55 is formed to extend through the pull tab main body 51, and on a region thereof at a side of the small projections 54, the handle portion 52 is formed to be recessed relative to a front surface of the pull tab main body 51.

**[0026]** The stopping claw body 6 has a main body 61, a claw portion 64 extending downward D from a rear B side of the main body 61, a locking portion 63 extending downward D from a front F side of the main body 61, and an elastic piece 62 cut and raised from the main body 61. Also, the claw portion 64 has a bent portion 65 provided at a leading end thereof opposite to the main body 61 to be bent toward the front F direction, and a notch portion 66 positioned above the bent portion 65 toward the upward U direction,

**[0027]** The main body 61 is formed in such a manner that the elastic piece 62 having elasticity is cut and raised from the middle of an originally single plate-shaped member in a longitudinal direction thereof. The elastic piece 62 is integrally formed with the claw portion 64 at a base end thereof and also extends to be spaced from the main body 61 in the upward and downward direction as it goes from the base end toward a leading end thereof. An elongated hole portion 67 is formed in a site which the cut and raised elastic piece 62 is originally located. The stopping claw body 6 has the locking portion 63 formed at one end thereof to be bent in a direction opposite to a direction in which the elastic piece 62 is cut and raised, and the claw portion 64 formed at the other end. The claw portion 64 has the bent portion 65 formed on at least a part of a leading end thereof in the right and left direction and the notch portion 66 formed on the other part. The notch portion 66 has a horizontal surface along the right and left direction of the claw portion 64, and the surface is abutted against the bottom portion 45. Alternatively, the claw portion 64 may not be provided with the bent portion 65.

**[0028]** The cover 7 has a cover top portion 71 and wall portions 72. The cover top portion 71 is a rectangular member, so that the wall portions 72 protrude, respectively, from four sides thereof. Recessed portions 73 are respectively formed on sides of both right and left wall portions 72 opposite to the cover top portion 71, so that upon assembling, the pivot 53 of the pull tab 5 can be inserted and rotatably held therein.

**[0029]** Fig. 4 is a sectional view of the slider 1 of the first embodiment after assembling.

**[0030]** Assembling of the slider 1 of the first embodiment is first performed by mounting the pivot 53 of the pull tab 5 between the first stepped portion 3 and the guide surface 43 provided on the upper surface 21a of the upper blade 21 of the body 2.

**[0031]** Subsequently, the stopping claw body 6 is arranged on the body 2 from the upper side thereof. At this time, the claw portion 64 of the stopping claw body 6 is

inserted into the claw hole 44 formed in the second stepped portion 4 of the body 2, so that the leading end of the claw portion 64 protrudes into the guide groove 38. Also, the elongated hole portion 67 of the stopping claw body 6 is fitted onto the protrusion 33 of the first stepped portion 3 and the main body 6 is mounted on the inclined portion 32, so that the locking portion 63 is locked on a downward D side of the protrusion 33 of the first stepped portion 3 from the front F side. Also, a part of the stopping claw body 6 at a side of the claw portion 64, is moved to be rotated upward about a part where the protrusion 33 and the locking portion 63 are in contact with each other.

**[0032]** Preferably, the bottom portion 45 is provided on either one of right and left sides of the claw hole 44, and the notch portion 66 is provided on either one of right and left sides of the claw portion 64 to correspond to the bottom portion 45, and the in-hole protrusion 46 is also provided on either one of right and left sides of the claw hole 44 to correspond to the bottom portion 45. According to the first embodiment, the bottom portion 45, the in-hole protrusion 46 and the notch portion 66 are provided on the left L side.

**[0033]** Then, the cover 7 is covered on the body 2 from the upper side. At this time, a small protruding piece 74 on a front one end of the cover 7 is fitted into the recessed portion 34 formed in the first stepped portion 3. Also, a bent portion on the leading end of the elastic piece 62 of the stopping claw body 6 is abutted against a back surface of the cover top portion 71. As a result, an elastic force is exerted downward D on the claw portion 64 of the stopping claw body 6. At this time, the stopping claw body 6 is arranged so that the notch portion 66 is abutted against the bottom portion 45 and also is prevented from being removed from the claw hole 44. Accordingly, a dimension by which the leading end of the claw portion 64 protrudes into the guide groove 28 can be kept constant.

**[0034]** Finally, wall portions 72 of the cover 7 opposite to the small protruding piece 74 are inserted into the hole portion 55 of the pull tab 5, the recessed portions 73 are arranged to avoid the pivot 53, and then the cover 7 is crimped on the first and second stepped portions 3 and 4.

**[0035]** Next, operations of the slider 1 of the first embodiment 1 will be described.

**[0036]** Fig. 5 is a sectional view taken through the claw hole 44 in a locked state of the slider 1 of the first embodiment. Fig. 6 is a sectional view taken through the bottom portion 45 in a locked state of the slider 1 of the first embodiment. Fig. 7 is a sectional view taken through the claw hole 44 in a moving state of the slider 1 of the first embodiment.

**[0037]** As shown in Fig. 5, the assembled slider 1 is shown in a state where the pivot 53 is spaced from the stopping claw body 6 and the bent portion 65 on the leading end of the claw portion 64 is inserted between elements 100 due to action of an elastic force of the elastic piece 62 so that movement of the slider 1 along the front and rear direction is stopped. In this stopped state, a locked state as described below refers to a state where a movement of the slide 1 in the rear direction, i.e., in a direction disengaging the elements is stopped. In the locked state, a stop function is exhibited because a front surface of the notch portion 66 of the claw portion 64, i.e., a surface which is located above an end surface of the claw portion 64 horizontal in the right and left direction and faces the locking portion 63, is abutted and stopped against the in-hole protrusion 46. Namely, because the slider 1 is trying to move in the rear direction R and relatively the elements 100 are trying to move in the front direction relative to the slider 1, the stopping claw body 6 and the claw portion 64 in the locked state are subjected to a force directing in the front direction F, but can withstand the force as the notch portion 66 and the in-hole protrusion 46 are abutted against each other, thereby allowing a rigid stopping. Also, because the notch portion 66 and the in-hole protrusion 46 are abutted against each other, when the claw portion 64 is pulled up, the claw portion 64 can be smoothly moved without collision of the claw portion 64 or the leading end of the claw portion 64 against the in-hole protrusion 46.

**[0038]** The in-hole protrusion 46 is formed above an edge portion of the claw hole 44 which faces the guide groove 28. Accordingly, the claw portion 64 in the claw hole 44 is arranged to have a gap from the front wall surface 4a of the claw hole 44, which is located below a part where the in-hole protrusion 46 and the claw portion 64 are abutted against each other. Thus, the claw portion 64 is not abutted against the front wall surface 4a. Also, if an imaginary line is drawn to extend downward D from an edge portion of the front wall surface 4a of the claw hole 44 which faces the guide groove, a space exists between the imaginary line and the leading end of the claw portion 44. Also, as shown in Fig. 6, the notch portion 66 of the stopping claw body 6 is abutted against the bottom portion 45 configured to block a part of the claw hole 44. Namely, the bottom portion 45 serves as a stopper for preventing the stopping claw body 6 from being removed from the claw hole 44 shown in Fig. 5.

**[0039]** As shown in Fig. 7, if the pull tab 5 is lifted from the state shown in Fig. 5, the stopping claw body 6 is abutted against the pivot 53 and the claw portion 64 is lifted upward, so that the bent portion 65 on the leading end of the claw portion 64 escapes from between the elements 100 and also the bent portion 65 on the leading end of the claw portion 64 escapes from the guide groove 28. Thus, the claw portion 64 does not come in contact with the elements 100 which are moving inside the guide groove 28. Also, if the pull tab 5 is moved in the front direction F, the slider 1 is freely slid in the front direction F to engage elements 100 of right and left fastener chains and thus to close the fastener chains not shown. Contrarily, the slider 1 can be also freely slid in the rear direction B to open the fastener chains.

**[0040]** If the pull tab 5 is released from the state shown in Fig. 7, the slider 1 becomes a state where, as shown in Fig. 5, the pivot 53 is spaced from the stopping claw

body 6 and the bent portion 65 on the leading end of the claw portion 64 is automatically inserted between the elements 100 due to action of an elastic force of the elastic piece 62. In this state, the slider 1 is restricted in movement along the front and rear direction, and thus movement of the slider 1 is stopped. At this time, the notch portion 66 of the claw portion 64 is abutted against the in-hole protrusion 46 and thus has a rigid stop function. Also, as shown in Fig. 6, the notch portion 66 of the stopping claw body 6 is abutted against the bottom portion 45 configured to block a part of the claw hole 44. Namely, the bottom portion 45 serves as a stopper for preventing the stopping claw body 6 from being removed from the claw hole 44 shown in Fig. 5.

**[0041]** Also, in the state shown in Fig. 5, the bent portion 65 on the leading end of the claw portion 64 is arranged to have a gap from the front wall surface 4a of the claw hole 44. Thus, the bent portion 65 is not abutted against the body 2 in the claw hole 44 and thus is prevented from being sandwiched between the body 2 and the elements 100. Accordingly, the pull tab 5 can be smoothly lifted as shown in Fig. 7.

**[0042]** In the locked state shown in Fig. 5, if a load is exerted on the slider 1 in an opening direction of the slide fastener, the body 2 is slightly moved in a direction of the rear mouth 27, but as shown in Fig. 6, the notch portion 66 of the stopping claw body 6 is abutted against the in-hole protrusion 46 of the claw hole 44, thereby preventing further movement of the body 2 and thus ensuring stopping of the slider 1.

**[0043]** Then, if the pull tab 5 is pulled rearward, as shown in Fig. 7, the pivot 53 is moved upward U along the guide surface 43. As a result, the pivot 53 is abutted against the stopping claw body 6 so that the stopping claw body 6 is lifted and thus the claw portion 64 escapes from between the elements 100. Then, the slider 1 is allowed to freely move in a direction of the rear mouth 27 and thus can open and separate fastener chains not shown.

**[0044]** As described above, according to the slider 1 of the first embodiment, the in-hole protrusion 46 is formed at a location on the wall surface 4a at the front F side of the claw hole 44, at which the claw portion 64 of the stopping claw body 6 is to be abutted thereon. Accordingly, the claw portion 64 is abutted against the in-hole protrusion 46, thereby providing a rigid stop function. Also, the in-hole protrusion 46 integrally extends from the bottom portion 45, so that the claw portion 64 is not caught on the edge portion of the claw hole 44, which faces the guide groove 28, and also a lower end edge of the notch portion is not caught on the in-hole protrusion 46. In addition, the leading end of the claw portion 64 is allowed to be spaced from the wall surface 4a of the claw hole 44 and thus can be prevented from being immovably sandwiched between the wall surface 4a of the claw hole 44 and the elements 100. Accordingly, the slider 1 which is allowed to move by smoothly releasing the locked state thereof caused by the stopping claw body 6 can be provided.

**[0045]** Also, because the claw portion 64 has, at the leading end thereof, the bent portion 65 bent toward the locking portion 63, an angle, at which the claw portion 64 is moved when the claw portion 64 is removed from the elements 100, can approximate to an angle of the bent portion 65. Accordingly, the slider 1 which allows the claw portion 64 to be easily removed from the elements 100 and thus can be smoothly operated can be provided.

**[0046]** Also, because the second attaching portion 4 has the bottom portion 45 configured to block a part of the claw hole 44 and the stopping claw body 6 has the notch portion 66 configured to be abutted against the bottom portion 45 by cutting out a part of the claw portion 64, the notch portion 66 can be abutted against the bottom portion 45 and thus the bottom portion 45 can serve as a stopper. Accordingly, the claw portion 64 can be prevented from being excessively bitten by the elements 100.

**[0047]** Also, because the in-hole protrusion 46 is formed vertically above the bottom portion 45, the in-hole protrusion 46 and the claw portion 64 are abutted against each other in a region vertically above the bottom portion 45. However, in a region vertically above the bent portion 65, the claw portion 64 are not abutted against a part of the wall surface 4a of the claw hole 44, on which the bottom portion 45 is not formed. Thus, a location, where the body 2 and the claw portion 64 are abutted against each other, and a location, where the body 2 and the claw portion 64 are not abutted against each other, are offset from one another in the right and left direction. Accordingly, a mutual interference between an abutting force of the claw portion 64 against the body 2 and an abutting force of the claw portion 64 against the elements 100 can be reduced, thereby providing the slider 1 which can be more smoothly operated.

**[0048]** Next, a second embodiment will be described.

**[0049]** Fig. 8 is a view showing a stopping claw body 6 of a slider 1 of a second embodiment. Fig. 9 is a sectional view taken through a claw hole 44 in a locked state of the slider 1 of the second embodiment.

**[0050]** In the slider 1 of the second embodiment, an on-claw protrusion 68 is formed on the stopping claw body 6. The on-claw protrusion 68 is inserted into the claw hole 44 to be oriented toward the first attaching portion 3 upon assembling and is formed at a location where the on-claw protrusion 68 can be abutted against the body 2 when the notch portion 66 is abutted against the bottom portion 45. Meanwhile, the on-claw protrusion 68 constitutes a protrusion according to the present invention.

**[0051]** In the locked state, if a load is exerted on the slider 1 in an opening direction, the body 2 is slightly moved in a direction of the rear mouth 27, but as shown in Fig. 9, the on-claw protrusion 68 of the stopping claw body 6 is abutted against the wall surface 4a of the claw hole 44 at the front F side, thereby preventing further movement of the body 2 and thus ensuring stopping of

the slider 1.

**[0052]** Then, if the pull tab 5 is pulled rearward, the pivot 53 is moved upward U along the guide surface 43. As a result, the pivot 53 is abutted against the stopping claw body 6 so that the stopping claw body 6 is lifted and thus the claw portion 64 escapes from between the elements 100. Then, the slider 1 is allowed to freely move in a direction of the rear mouth 27 and thus can open and separate fastener chains not shown.

**[0053]** As described above, according to the slider 1 of the second embodiment, the on-claw protrusion 68 is formed on the claw portion 64 of the stopping claw body 6 to be abutted against the wall surface 4a of the claw hole 44 at the front F side. Accordingly, the on-claw protrusion 68 is abutted against the wall surface 4a of the claw hole 44 at the front F side, thereby providing a rigid stop function. In addition, because the on-claw protrusion 68 is abutted against the front wall surface 4a at a location which is located above the edge portion of the claw hole 44, which faces the guide groove 28, the leading end of the claw portion 64 is spaced from the wall surface 4a of the claw hole 44. Thus, the claw portion 64 is not caught on the edge portion of the claw hole 44, which faces the guide groove 28, and thus can be prevented from being sandwiched between the wall surface 4a of the claw hole 44 and the elements 100, thereby providing the slider 1 which can be smoothly operated. Accordingly, the claw portion 64 in the claw hole 44 is arranged to have a gap from a part of the front wall surface 4a of the claw hole 44, which is located below a location where the on-claw protrusion 68 is abutted against the front wall surface 4a, so that the claw portion 64 is not abutted against the front wall surface 4a.

**[0054]** Meanwhile, although the slider 1 of the second embodiment shown in Fig. 9 does not have the in-hole protrusion 46 formed in the claw hole 44 of the body 2 of the first embodiment shown in Fig. 1, the slider 1 may be configured to have the in-hole protrusion 46 formed in the claw hole 44 of the body 2, in addition to the on-claw protrusion 68 formed on the stopping claw body 6. Namely, the in-hole protrusion 46 and the on-claw protrusion 68 may be respectively formed on both of the body 2 and the stopping claw body 6.

**[0055]** Fig 10 is a view showing bottom portions 45 of a slider 1 of an alternative embodiment.

**[0056]** The bottom portion 45 of the claw hole 44 may be provided to be split into right and left sides. Namely, bottom portions 45 are provided to respectively extend from the side wall portion 4c at the left L side and the side wall portion 4d at the right R side in directions approaching each other so that a space is provided between the bottom portions 45. The space is a hole portion configured to allow the claw portion 64 to be inserted into the guide groove 28. In this case, notch portions 66 are also preferably provided to be split into right and left sides, corresponding to the bottom portions 45. Further, in-hole protrusions 46 are also preferably provided to be split into right and left sides, corresponding to the bottom portions 45.

**[0057]** Alternatively, instead of the in-hole protrusions 46, an on-claw protrusion, not shown, may be provided on the claw body 64 of the stopping claw body 6. Also, assembling and operations are the same as those of the first and second embodiments.

**[0058]** As described above, because the bottom portions 45 of the claw hole 44, the notch portions 66 of the stopping claw body 6 and the in-hole protrusions 46 are provided to be split into right and left sides, the claw portion 64 in the locked state can be abutted at right and left notch portions 66 thereof when a force is exerted on the claw portion 64 from the elements 100. Accordingly, the slider 1 which has a balanced stop function can be provided.

**[0059]** Fig. 11 is a view showing a slider 1 of an alternative embodiment.

**[0060]** A slider 1 of an example shown in Fig. 11 is not provided with the cover 7 employed in the first and second embodiments and thus has a structure in which a pair of crimping portions 8 of a body 2 are crimped at leading ends thereof in the front and rear direction to rotatably attach a pivot of a pull tab 5. The crimping portions 8 are respectively provided on right and left sides of an upper surface of the body 2 and also on both right and left sides of a stopping claw body 6. In addition, the stopping claw body 6 is also attached in a crimping manner by crimping portions 35 of the body 2. The crimping portions 35 are respectively provided on right and left sides of the upper surface of the body 2 and also on both right and left sides of the stopping claw body 6 by a first attaching portion, and thus have a structure in which the crimping portions 35 are crimped to surround and attach the stopping claw body 6 from both sides thereof.

**[0061]** The slider 1 of this structure is configured so that as the pull tab 5 is rotated upward from a state shown in Fig. 11, the pivot 53 having a cam shape is rotated to push up the rear B side of the stopping claw body 6 upward U, as a result of which the stopping claw body 6 is lifted and a claw portion 64 thereof escapes from between elements not shown. Then, the slider 1 can be freely slid in the front direction F to close fastener chains, not shown, or can be freely slid in the rear direction B to open the fastener chains.

**[0062]** If the pull tab 5 is released, as shown in Fig. 11, the pivot 53 is rotated and the claw portion 64 is inserted between elements 100, so that the slider 1 is stopped. At this time, as shown in Fig. 11, a notch portion 66 of the stopping claw body 6 is abutted against a bottom portion 45 configured to block a part of a claw hole 44. Namely, the bottom portion 45 serves as a stopper for preventing the stopping claw body 6 from being removed from the claw hole 44.

**[0063]** In this locked state, if a load is exerted on the slider 1 in a direction of opening the slide fastener, the body 2 is slightly moved in a direction of the rear mouth 27, but as shown in Fig. 11, the notch portion 66 of the stopping claw body 6 is abutted against an in-hole pro-

trusion 46 of the claw hole 44 to prevent further movement, thereby ensuring stopping of the slider 1.

**[0064]** Then, if the pull tab 5 is rotated upward U from the state shown in Fig. 11, the stopping claw body 6 is lifted by the pivot 53 and the claw portion 64 escapes from between elements not shown. Thus, the slider 1 is allowed to freely move in a direction of the rear mouth 27 and thus can open and separate fastener chains not shown.

**[0065]** As described above, the slider 1 of the present embodiment includes a body 2 having a guide post 23 connecting one side of the upper blade 21 and one side of the lower blade 22; a stopping claw body 6 having at one side thereof a locking portion 63 locked on the body 2 and at the other side a claw portion 64 movable relative to the body 2; and a pull tab 5 rotatably mounted on the body 2 and capable of moving the claw portion 64, wherein the body 2 includes a first attaching portion 3 provided on one side of an upper surface 21 a of the upper blade 21 and configured to lock the locking portion 63, a second attaching portion 4 provided on the other side of the upper surface 21 a of the upper blade 21 and formed with a claw hole 44 allowing the claw portion 64 to be inserted therethrough, and a mounting portion 29 provided between the first and second attaching portions 3 and 4 to allow the pull tab 5 to be rotatably mounted thereon; and wherein the claw hole 44 has an in-hole protrusion 46 formed at a location where the stopping claw body 6 and the claw hole 44 are abutted against each other. Accordingly, as the claw portion 64 is abutted against the in-hole protrusion 46, a rigid stop function can be provided and also a leading end of the claw portion 64 can be spaced from the wall surface 4a of the claw hole 44 to be prevented from being immovably sandwiched between the wall surface 4a of the claw hole 44 and the elements 100, thereby providing the slider 1 which can be smoothly operated. In this embodiment, the in-hole protrusion 46 is also formed to integrally extend upward U from the bottom portion 45 in a vertical direction to the bottom portion 45 and also to protrude rearward B from the front wall surface 4a at the front F side. Alternatively, an on-claw protrusion 68 may be formed on the stopping claw body 6 so that the on-claw protrusion 68 is abutted against the front wall surface 4a of the claw hole 44.

**[0066]** Also, in the slider 1 of the present embodiment, the claw portion 64 has a straight shape at the leading end thereof, but the leading end of the claw portion 64 may have a bent portion 65 bent toward the locking portion 63 as described in the first embodiment. Accordingly, the slider 1 which allows the claw portion 64 to be easily removed from the elements 100 and thus can be smoothly operated can be provided.

**[0067]** Further, in the slider 1 of the present embodiment, the second attaching portion has the bottom portion 45 configured to block a part of the claw hole 44 and the stopping claw body 6 has the notch portion 66 configured to be abutted against the bottom portion 45 by cutting out a part of the claw portion 64. Accordingly, the notch portion 66 can be abutted against the bottom portion 45 and thus the bottom portion 45 can serve as a stopper, thereby preventing the claw portion 64 from being excessively bitten by the elements 100.

**[0068]** Further, in the slider 1 of the present embodiment, the in-hole protrusion 46 is formed vertically above the bottom portion 45 so that the in-hole protrusion 46 and the claw portion 64 are abutted against each other in a region vertically above the bottom portion 45. In addition, in a region vertically above the bent portion 65, the claw portion 64 are not abutted against a part of the wall surface 4a of the claw hole 44, on which the bottom portion 45 is not formed. Thus, a location, where the body 2 and the claw portion 64 are abutted against each other, and a location, where the body 2 and the claw portion 64 are not abutted against each other, are offset from one another in the right and left direction. Accordingly, a mutual interference between an abutting force of the claw portion 64 against the body 2 and an abutting force of the claw portion 64 against the elements 100 can be reduced, thereby providing the slider 1 which can have a rigid stop function and can be smoothly operated.

**[0069]** In addition, in the slider 1 of the present embodiment, the bottom portion 45 is provided to be split on opposing end sides of the claw hole 44, the notch portion 46 is provided to be split on the opposing end sides of the claw hole 44 corresponding to the bottom portion 45, and the in-hole protrusion 46 is provided to be split on the opposing end sides of the claw hole 44 corresponding to the bottom portion 45. Accordingly, the stopping claw body 6 is abutted against elements, not shown, in the vicinity of the middle of the body 2 in the right and left direction, thereby providing the slider 1 which has a balanced stop function.

**[0070]** In the foregoing, although various embodiments of the present invention have been described, the invention is not limited to these embodiments and accordingly any other embodiments modified from configurations of each of the embodiments or configured by appropriately combining configurations of the embodiments are also intended to be fallen within the scope of the invention.

## Claims

**1.** A slider for slide fastener, comprising:

a body (2) having upper and lower blades (21, 22) connected by a guide post (23) and a guide groove (28) between the upper and lower blades (21, 22);

a stopping claw body (6) having, at one side thereof, a locking portion (63) locked on the body (2) and, at the other side, a claw portion (64) movable relative to the body (2); and

a pull tab (5) mounted on the body (2) and capable of moving the claw portion (64);

wherein the body (2) includes:

an attaching portion (3) provided on an upper surface (21 a) of the upper blade (21) at a side of the guide post (23), and configured to lock the locking portion (63);
a claw hole (44) provided on the upper surface (21a) of the upper blade (21) at a side opposite to the guide post (23), and communicated with the guide groove (28) to allow the claw portion (64) to be inserted therethrough; and
a mounting portion (29) provided between the attaching portion (3) and the claw hole (4) to allow the pull tab (5) to be mounted thereon,

wherein at least one of the stopping claw body (6) and the claw hole (44) is formed with a protrusion (46, 68) at a location where the stopping claw body (6) and the claw hole (44) are abutted against each other, and
wherein the abutted location is located above an edge portion of the claw hole (44) at a side of the guide groove (28).

**2.** The slider for slide fastener according to claim 1, wherein the protrusion (46) is formed on a wall surface (4a) of the claw hole (44) at a side of the guide post (23), and the protrusion (46) protrudes in a direction opposite to the guide post.

**3.** The slider for slide fastener according to claim 1,
wherein a bottom portion (45) is provided in a part of the claw hole (44), and
wherein the stopping claw body (6) has a notch portion (66) provided in a part of the claw portion (64) and capable of being abutted against the bottom portion (45).

**4.** The slider for slide fastener according to claim 3, wherein the notch portion (66) is abutted against the protrusion (46).

**5.** The slider for slide fastener according to claim 4, wherein the protrusion (46) is formed to extend upward in a vertical direction to the bottom portion (45).

FIG.1

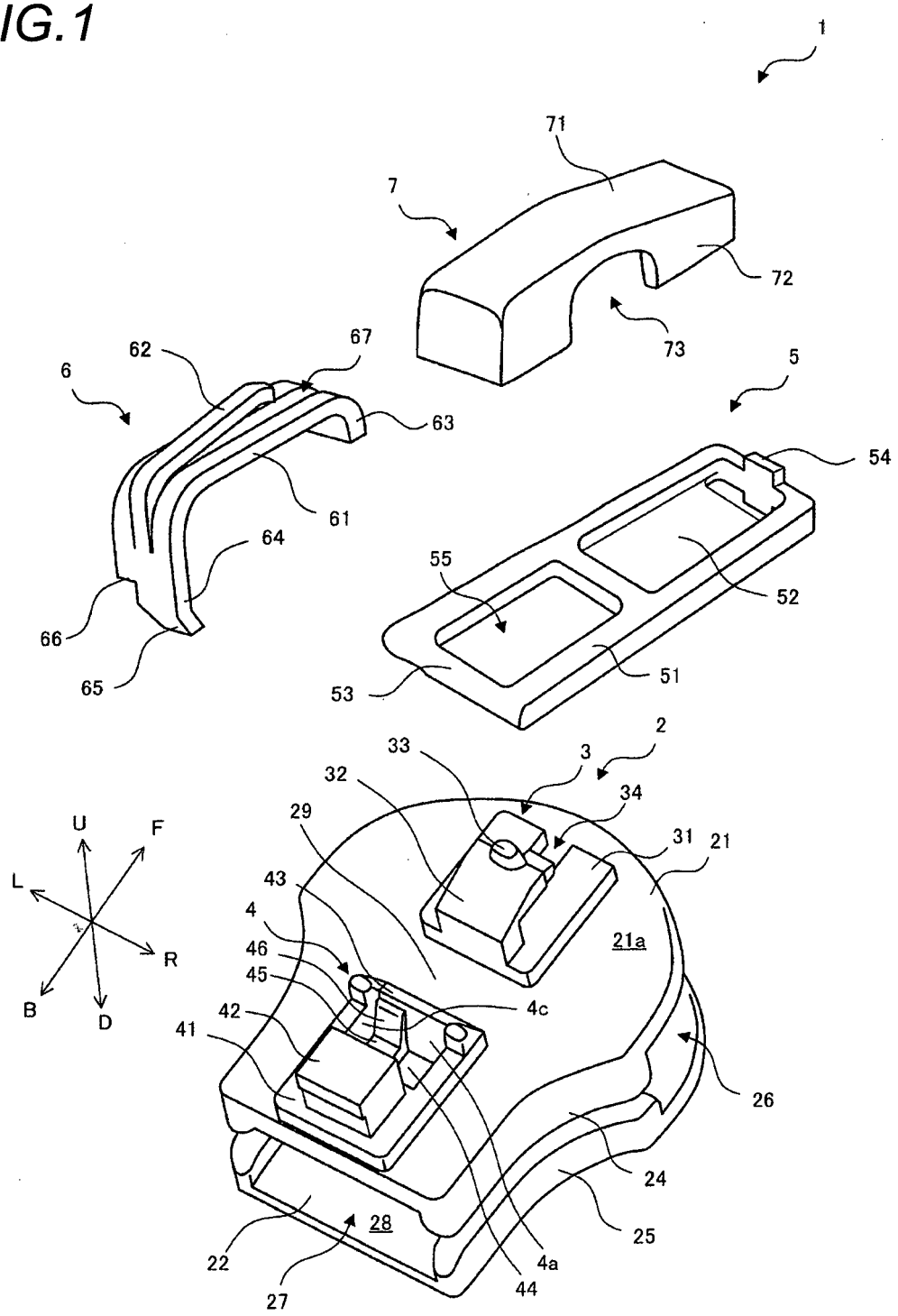
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FIG.2

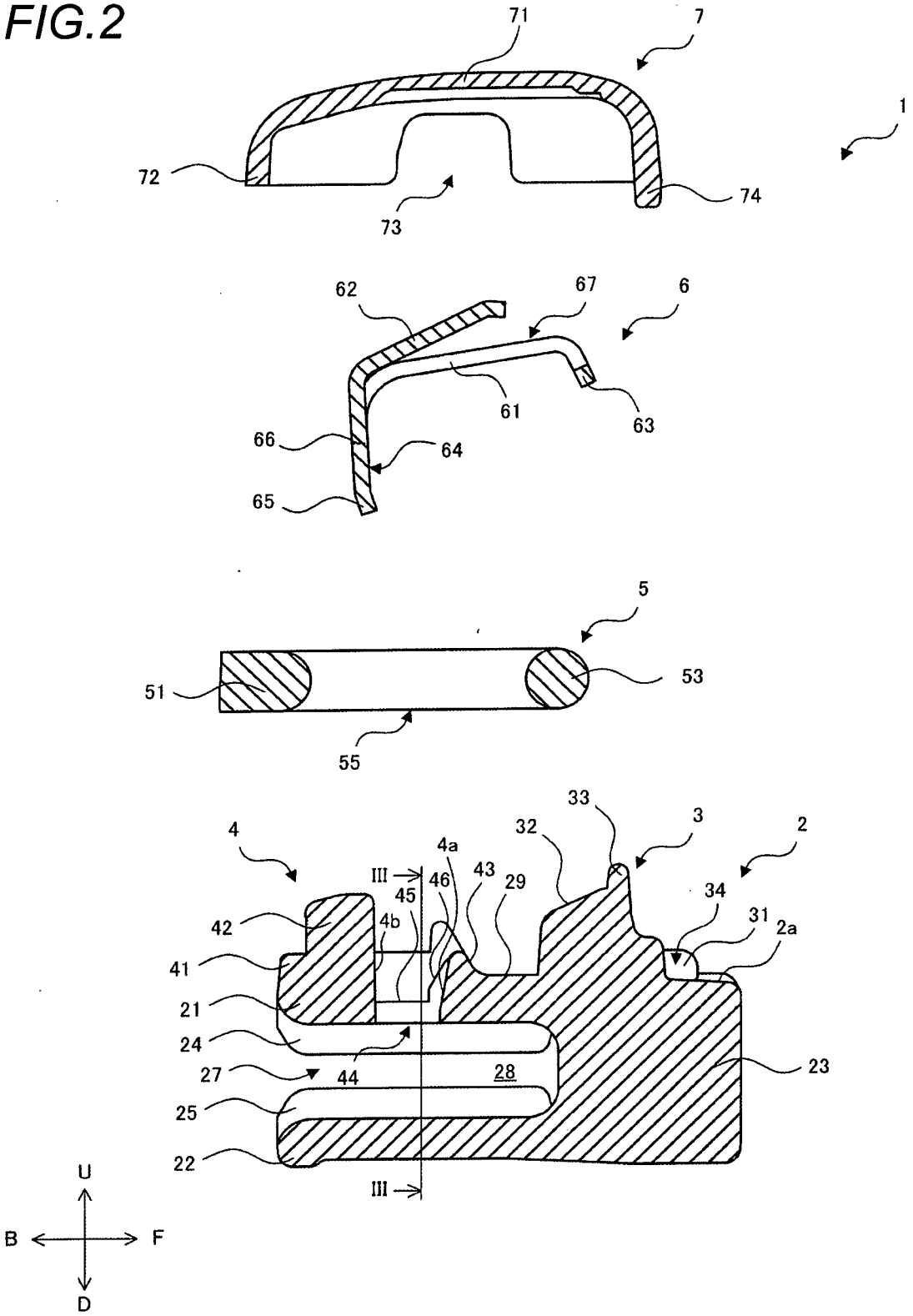
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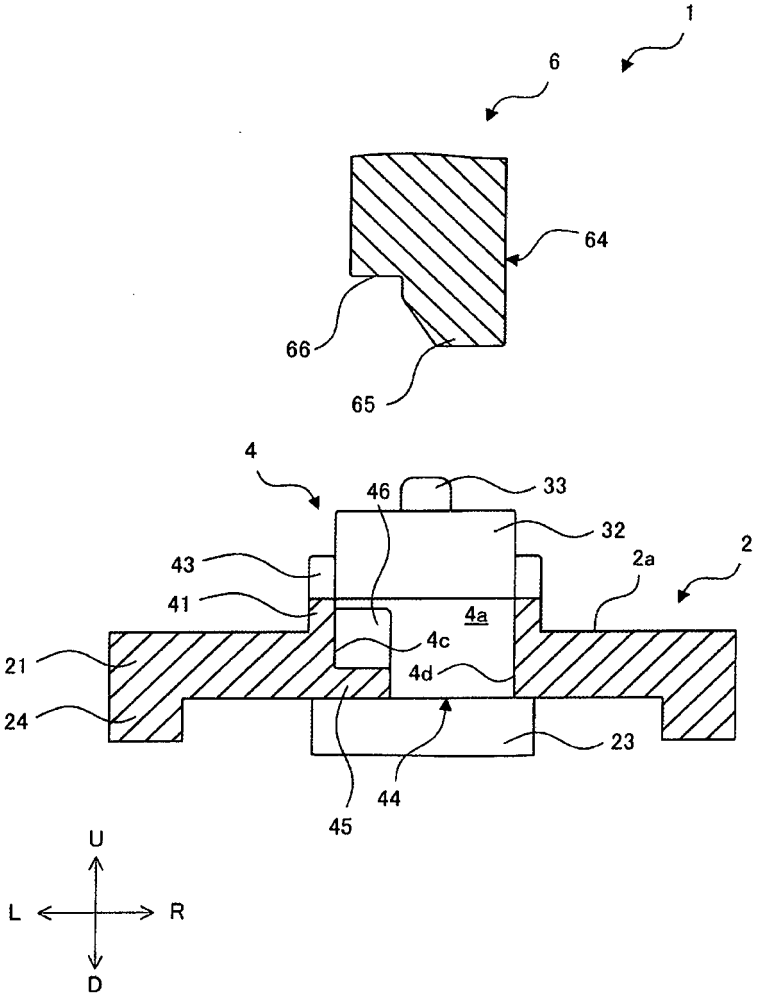
FIG.3



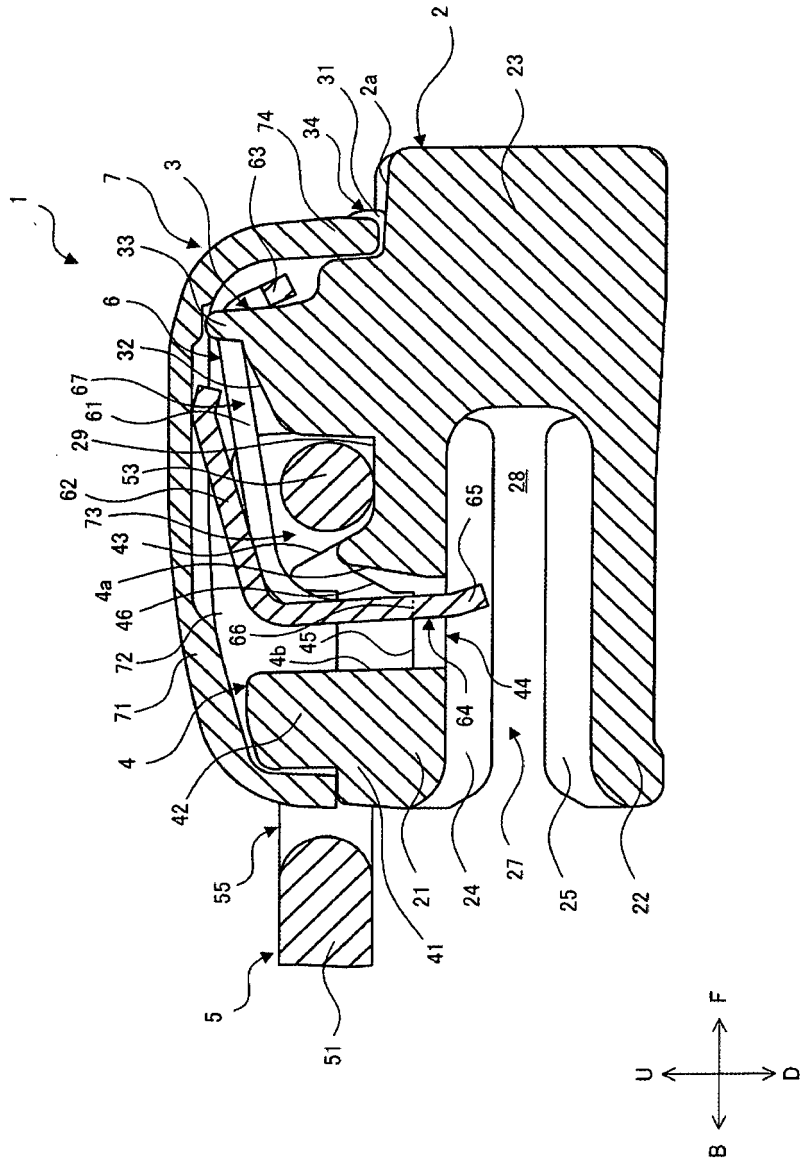

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FIG.4

FIG.5

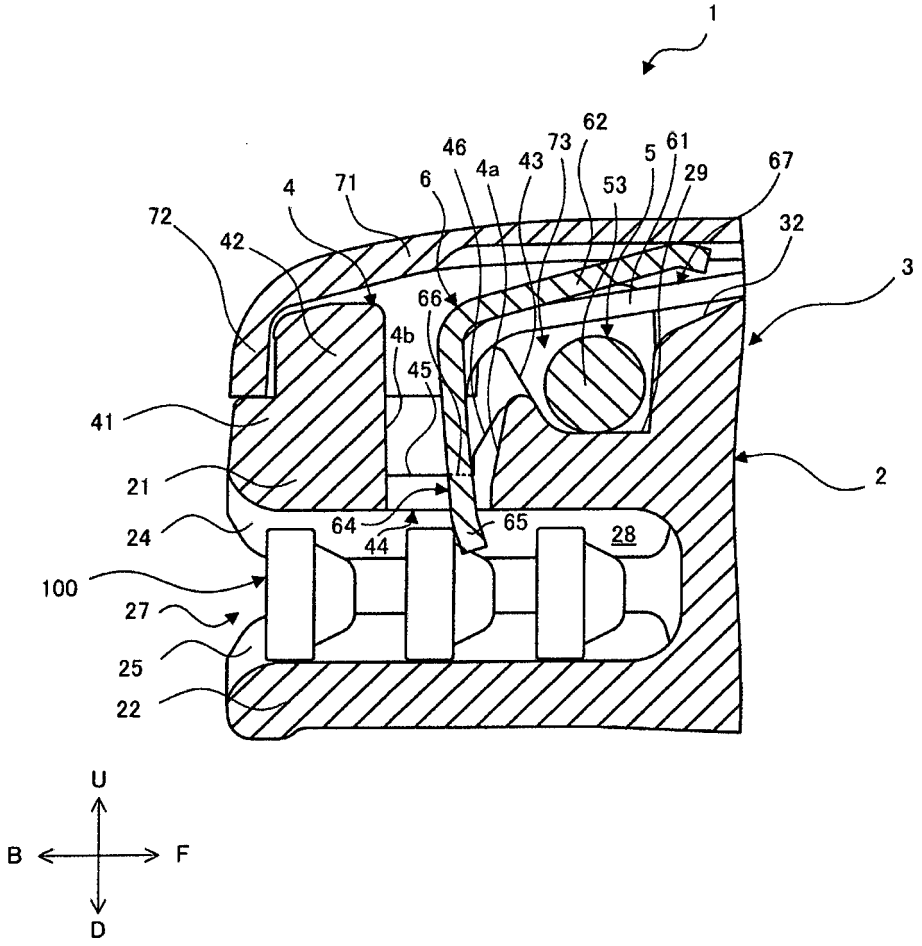
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FIG.6

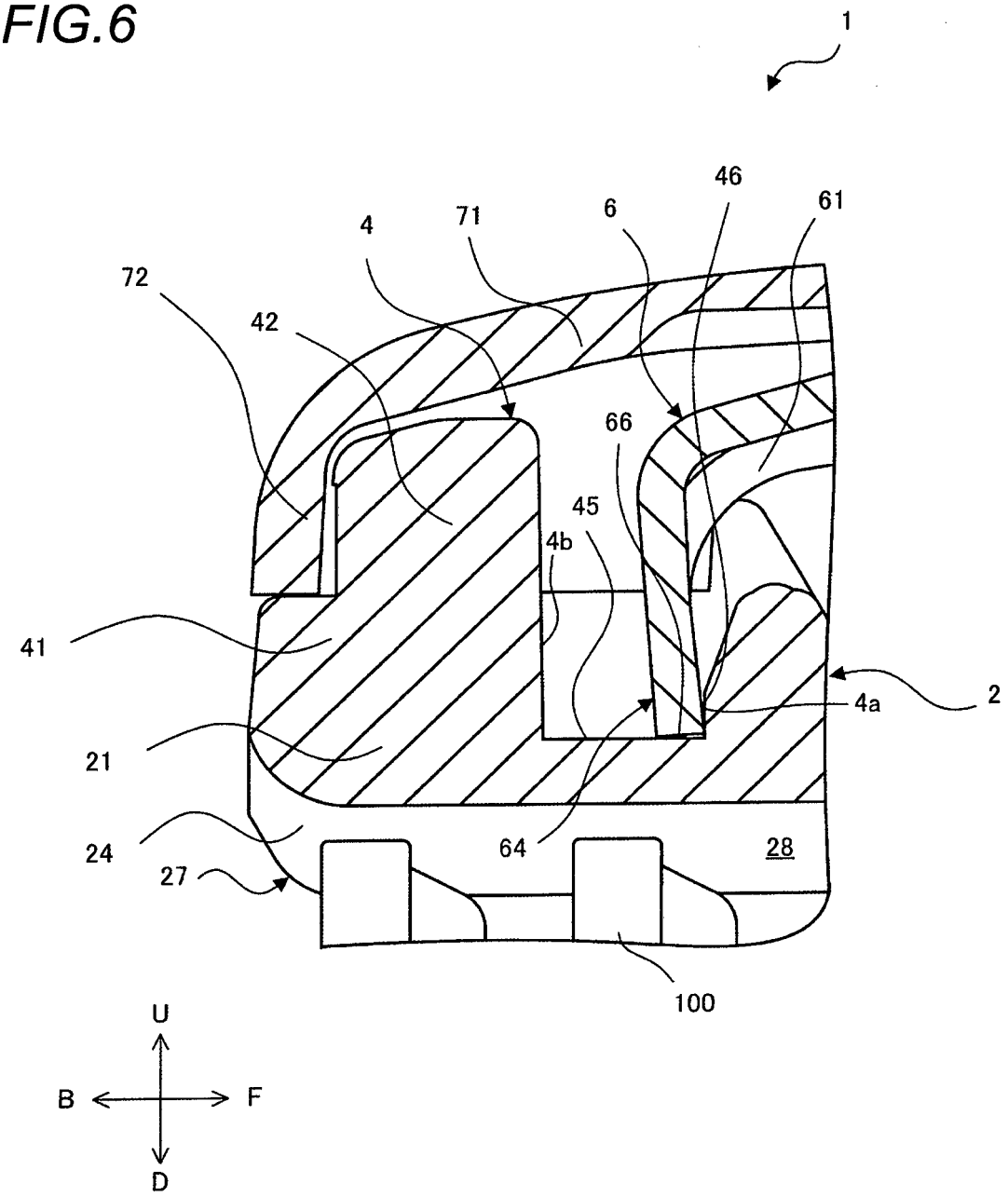

FIG.7

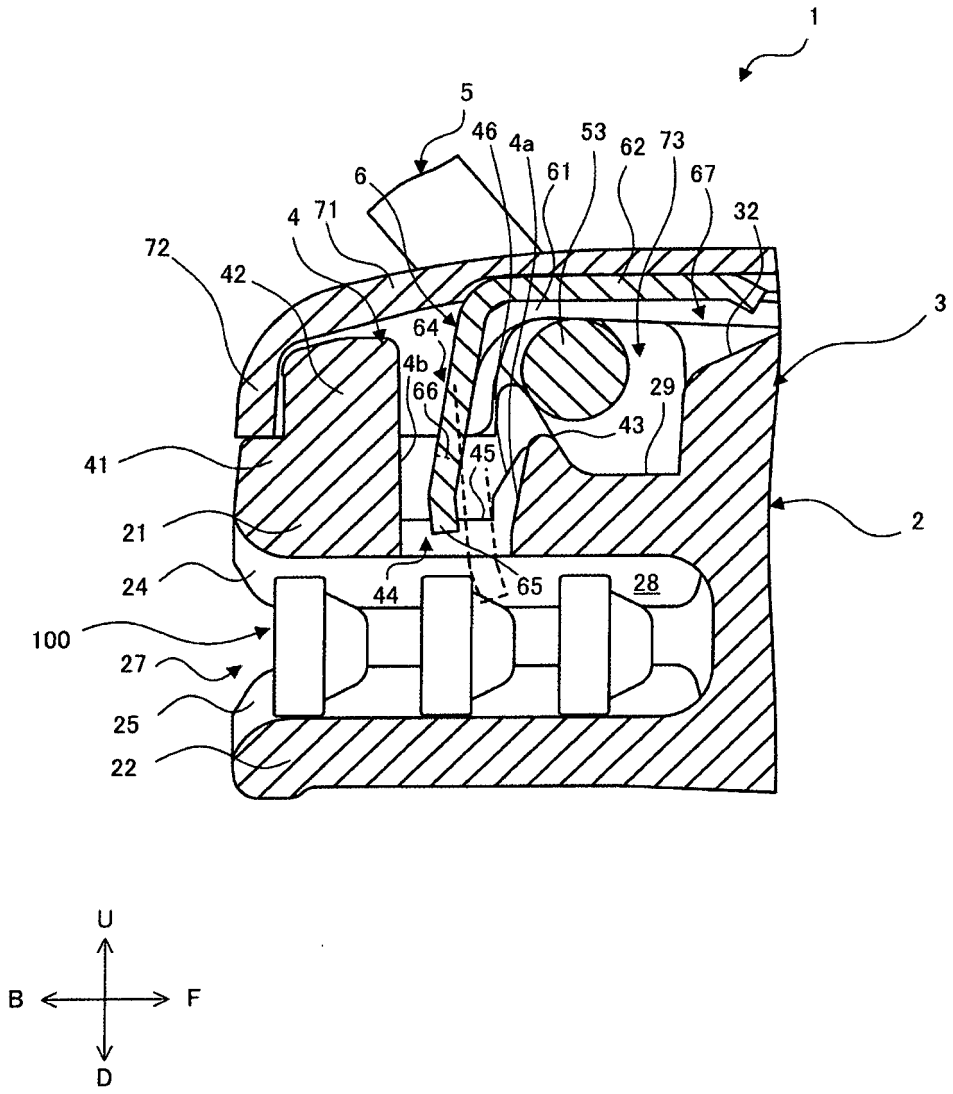
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FIG.8

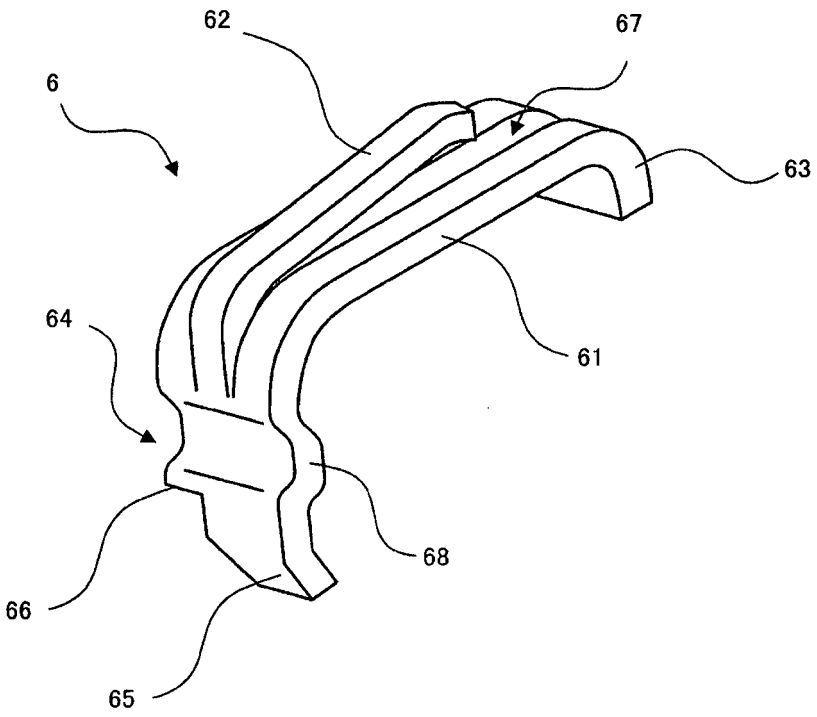

FIG.9

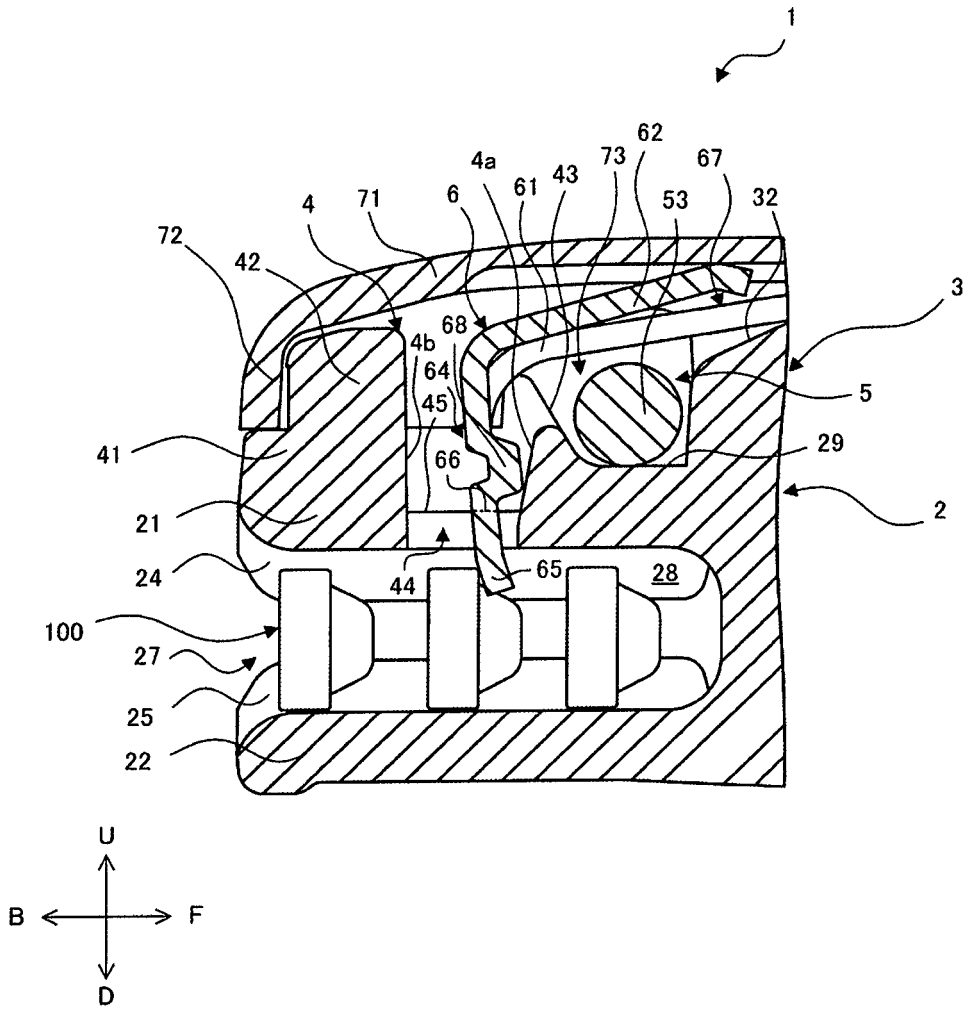
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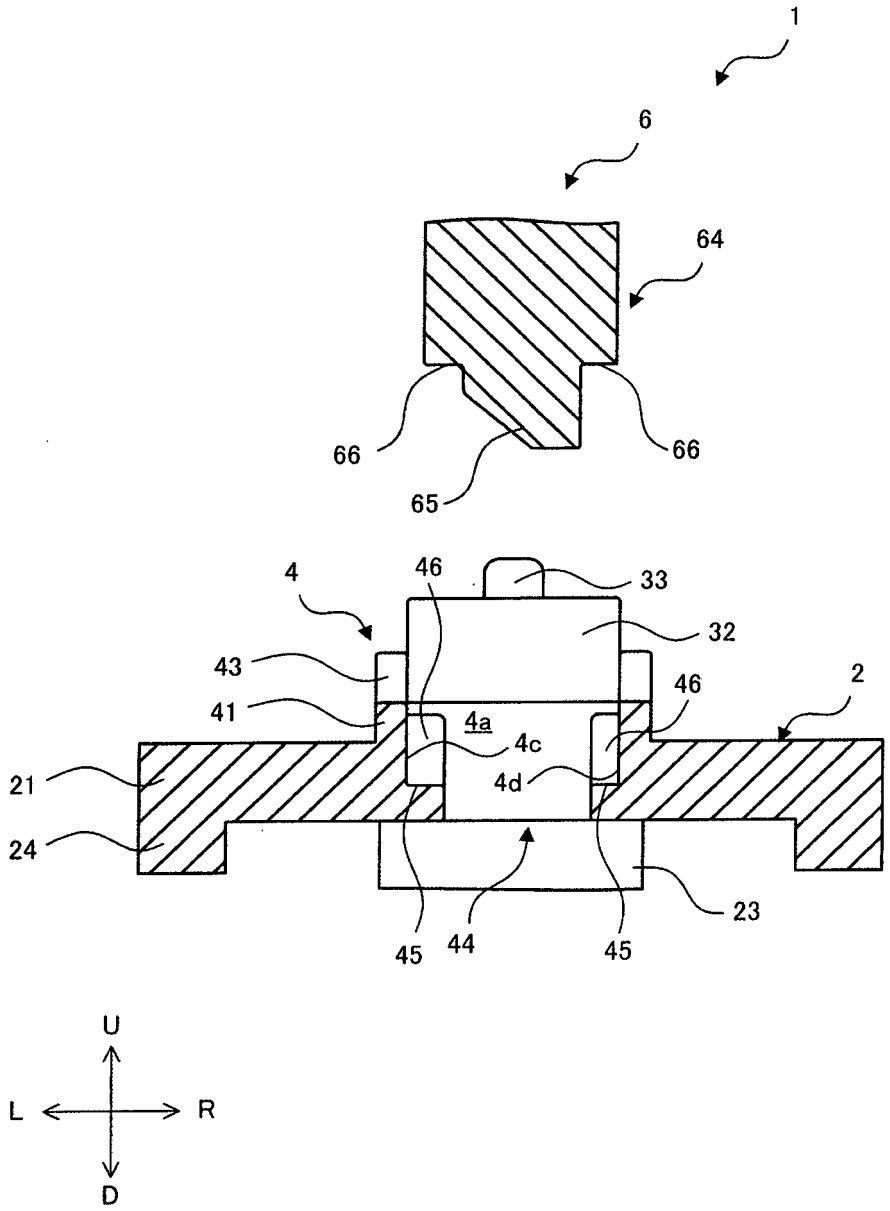
FIG.10



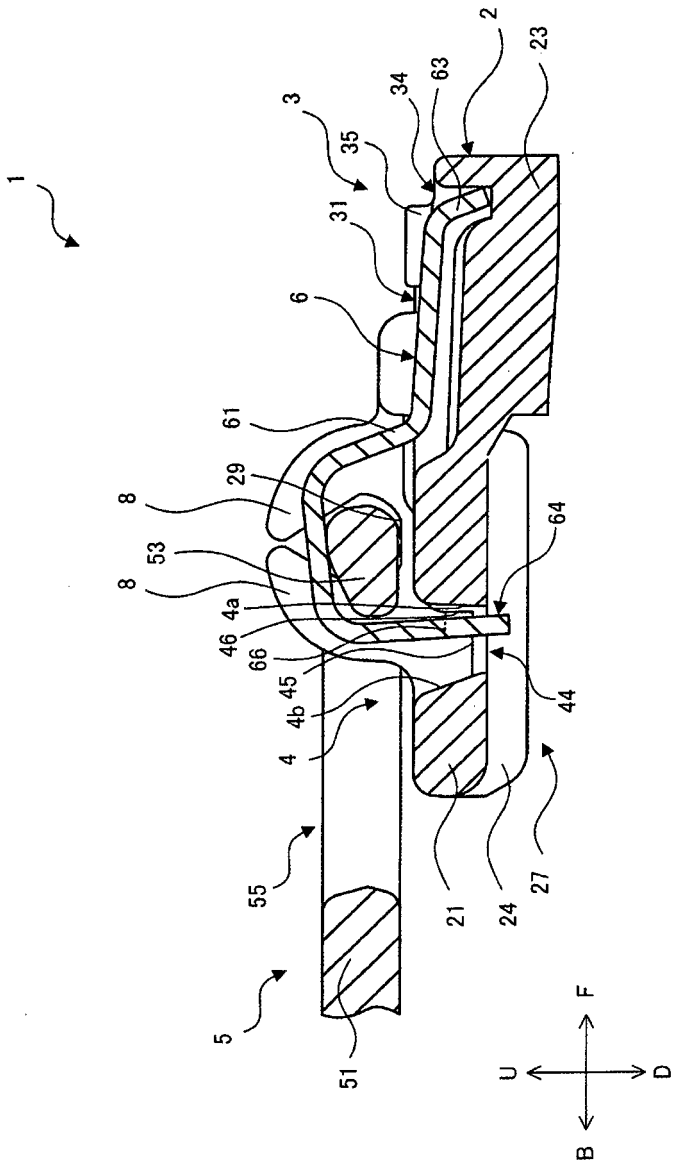

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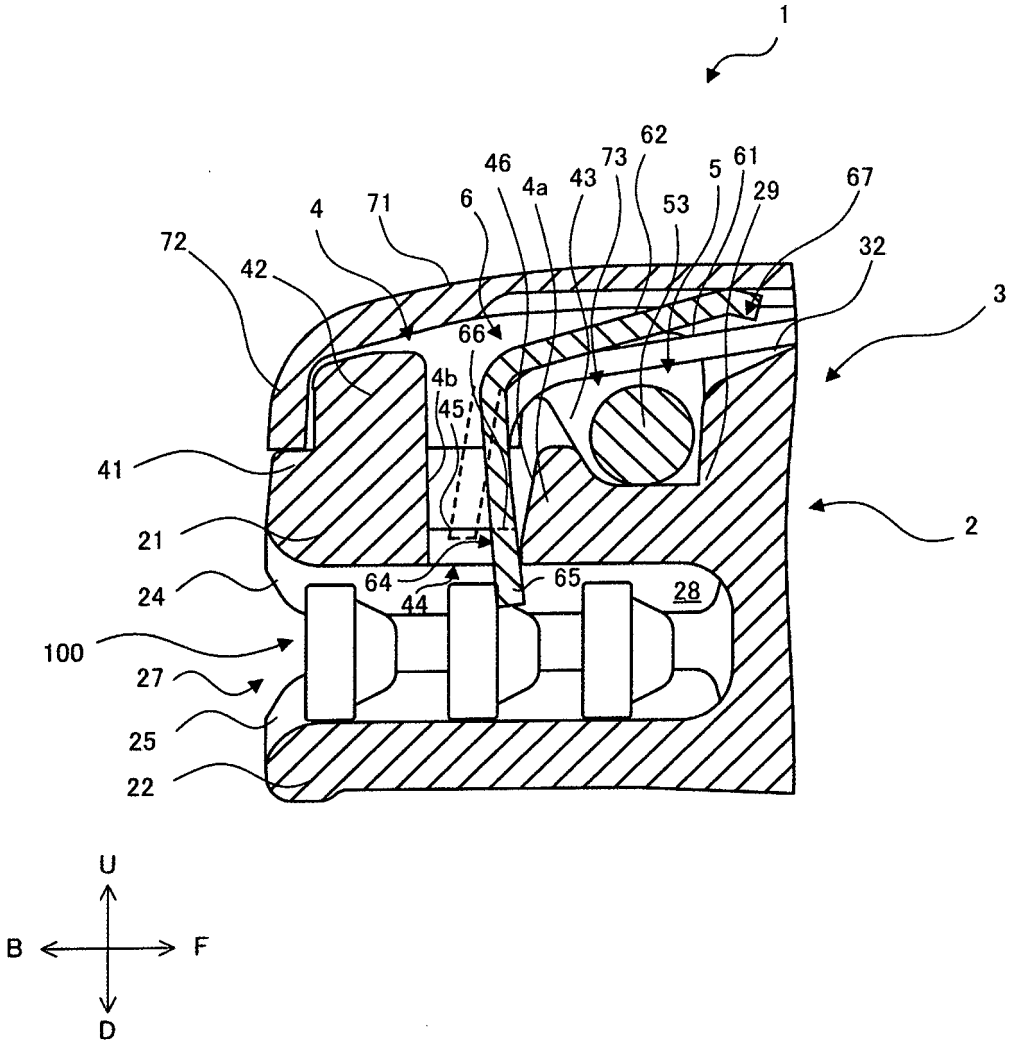
FIG.11

FIG.12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## INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2013/066075

A. CLASSIFICATION OF SUBJECT MATTER
*A44B19/30*(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)
A44B19/26-19/30

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 1996-2013
Kokai Jitsuyo Shinan Koho 1971-2013 Toroku Jitsuyo Shinan Koho 1994-2013

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. |
|---|---|---|
| X | WO 2012/172692 A1 (YKK Corp.), 20 December 2012 (20.12.2012), entire text; all drawings & TW 201300038 A | 1-5 |
| X<br>A | JP 6-245805 A (Yoshida Kogyo Co., Ltd.), 06 September 1994 (06.09.1994), entire text; all drawings & US 5419019 A & EP 612486 A1 & DE 69417612 C & HK 1005828 A & KR 10-1996-0001552 B & CN 1096186 A | 1-4<br>5 |
| X<br>A | US 3099059 A (Scovill Manufacturing Co.), 30 July 1963 (30.07.1963), entire text; all drawings (Family: none) | 1,2<br>3-5 |

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

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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 03 September, 2013 (03.09.13) | 17 September, 2013 (17.09.13) |
| Name and mailing address of the ISA/<br>Japanese Patent Office<br><br>Facsimile No. | Authorized officer<br><br>Telephone No. |

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**INTERNATIONAL SEARCH REPORT**

International application No.
PCT/JP2013/066075

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X<br>A | JP 47-001872 Y1 (Scovill Manufacturing Co.),<br>22 January 1972 (22.01.1972),<br>entire text; all drawings<br>(Family: none) | 1,2<br>3-5 |
| X<br>Y<br>A | JP 11-127918 A (YKK Corp.),<br>18 May 1999 (18.05.1999),<br>entire text; all drawings<br>(Family: none) | 1<br>3<br>2,4,5 |
| Y<br>A | JP 3173803 U (Tsai Ching Jen),<br>23 February 2012 (23.02.2012),<br>entire text; all drawings<br>& TWU 00M403917 | 3<br>1,2,4,5 |

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## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


- JP H10127313 B **[0003]**