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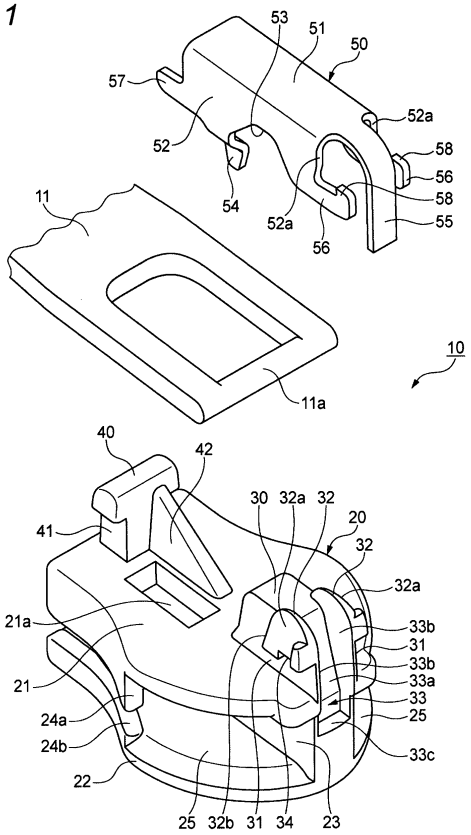
# (54) SLIDER FOR SLIDE FASTENER

(57) Provided is a slider for a slide fastener, whereby several bodies can be obtained in one casting process and production costs can be reduced. A cover member (50) has a pair of right and left front-side engagement pieces (56) that engage with a front-side pillar section (30) and a pair of right and left rear-side engagement pieces (57) that engage with a rear-side pillar section (40). Front-side recessed sections for engagement (31) having a surface facing the upper surface of the front-side engagement pieces (56) are formed in the right and left side surfaces of the front-side pillar section (30); rear-side recessed sections for engagement (41) having a surface facing the upper surface of the rear-side engagement pieces (57) are formed in the right and left side surfaces of the rear-side pillar section (40); and the front-side and rear-side recessed sections for engagement (31, 41) are formed penetrating along the front-rear direction of the bodies (20).

*FIG.1*

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## Description

### Technical Field

**[0001]** The present invention relates to a slider for slide fastener.

### Background Art

**[0002]** As a slider for slide fastener known in the related art, there is a slider that includes a body, a cover member, and a pull-tab. The cover member includes a hook which enters an element guide path through a hook hole of the body, an elastic piece which presses the cover member so that the hook enters the element guide path, and front-side and rear-side engagement pieces which are respectively engaged with front-side and rear-side post sections which are erected on the upper surface of the body. The front-side post section has a rear-side engagement recess which is engaged with the rear-side engagement piece of the cover member. (See, for example, Patent Document 1.)

### Prior Art Document

### Patent Document

**[0003]** Patent Document 1: Japanese Patent Application Publication No. 2007-111351A

### Summary of Invention

### Problems to Be Solved by Invention

**[0004]** However, in order to cast the body disclosed in Patent Document 1, there required are an upper mold, a lower mold, a slide core which moves in the front-rear direction of the body in order to form an element guide path, and a slide core which moves in the lateral direction perpendicular to the front-rear direction of the body in order to form front-side engagement recesses and rear-side engagement recesses in a front-side post section and a rear-side post section. In addition, in order to cast a plurality of bodies using molds in a single time, it is preferable for efficiency to perform molding in the state in which a plurality of the molds are arranged in one direction.

**[0005]** In addition, when element guide paths of respective bodies are concurrently molded using the slide cores which move in the front-rear direction of the bodies, the bodies are molded in the state in which they are arranged in the lateral direction. Here, when the slide core which moves in the lateral direction is used, the range in which the slide core can move is required to be obtained also in the lateral direction of the mold. This consequently reduces the space in which the bodies are arranged. Therefore, the number of bodies that can be produced in a single casting process must be reduced, thereby increasing the manufacturing cost of the slider for slide fastener.

**[0006]** Accordingly, the present invention has been made keeping in mind the above problems occurring in the related art, and an object of the present invention is to provide a slider for slide fastener in which a plurality of bodies can be produced in a single casting process and the manufacturing cost can be reduced.

### Means for Solving Problems

**[0007]** The object of the present invention is achieved by the following configurations.

(1) A slider for slide fastener including a body; and a cover member supported on a front-side post section and a rear-side post section which are erected on an upper surface of the body, wherein the cover member includes: a top plate; a pair of right and left side plates which extend downward from both side edges of the top plate; pull-tab receiving recesses which are respectively formed in the pair of right and left side plates and receive a shaft portion of a pull-tab; a hook which enters an element guide path of the body through a hook hole formed in the body; an elastic piece which extends forward from a front end portion of the top plate, a leading end of the elastic piece being bent downward; a pair of right and left front-side engagement pieces which respectively extend forward from front end portions of the pair of right and left side plates and engage with the front-side post section; a pair of right and left rear-side engagement pieces which extend rearward from rear end portions of the pair of right and left side plates and engage with the rear-side post section; a concavely-shaped elastic piece receiving portion which is formed in a front surface of the front-side post section, the elastic piece receiving portion receiving the elastic piece; front-side engagement recesses which are respectively formed in right and left side surfaces of the front-side post section, the front-side engagement recesses having surfaces which face upper surfaces of the front-side engagement pieces; and rear-side engagement recesses which are respectively formed in right and left side surfaces of the rear-side post section, the rear-side engagement recesses having surfaces which face upper surfaces of the rear-side engagement pieces, and wherein the front-side and rear-side engagement recesses are formed so as to penetrate in a front-rear direction of the body.

(2) The slider for slide fastener according to (1), wherein protrusions which protrude outward in a lateral direction of the body are respectively formed on right and left side surfaces of the front-side post section, and wherein front end surfaces of the pair of right and left side plates of the cover member come into contact with rear surfaces of the protrusions, and

the elastic piece comes into contact with the elastic piece receiving portion.

(3) The slider for slide fastener according to (1) or (2), wherein a pair of right and left latching step portions are formed on the body, and wherein latching protrusions which are latched to the latching step portions are respectively formed on the pair of right and left front-side engagement piece.

(4) The slider for slide fastener according to (3), wherein the latching step portions which are upwardly-recessed are formed on right and left side surfaces of the front-side post section, and wherein the latching protrusions which protrude upward and are latched to the latching step portions are respectively formed on the pair of right and left front-side engagement pieces.

(5) The slider for slide fastener according to (3), wherein the body has an upper blade and a lower blade which are arranged in parallel so as to be spaced apart from each other in an upward and downward direction and a guide post which connects a front end portion of the upper blade to a front end portion of the lower blade, wherein the pair of right and left latching step portions which are downwardly-recessed are formed in the upper blade, and wherein the latching protrusions which protrude downward and are latched to the latching step portions are respectively formed on the pair of right and left front-side engagement pieces.

## Advantageous Effects of Invention

**[0008]** In the slider for slide fastener according to the present invention, since the front-side and rear-side engagement recesses are formed to penetrate through the body in the front-rear direction, the front-side and rear-side engagement recesses can be formed using the slide core which moves in the front-rear direction of the body. It is therefore possible to preclude the slide core which moves in the lateral direction of the body and with which the front-side and rear-side engagement recesses 31 and are formed. Due to this, a plurality of bodies can be produced in a single casting process, thereby reducing the manufacturing cost of the slider.

**[0009]** In addition, in the slider for slide fastener according to the present invention, the latching step portions are respectively formed on the right and left surfaces of the front-side post section, and the latching protrusions which are latched to the latching step portions are respectively formed on the pair of right and left front-side engagement pieces. Thus, it is possible to prevent the cover member from moving rearward through latching between the latching step portions and the latching protrusions. This can consequently prevent metal fatigue in the elastic piece of the cover member.

## Brief Description of Drawings

**[0010]**

FIG. 1 is an exploded perspective view illustrating a first embodiment of a slider for slide fastener according to the invention;

FIG. 2 is a longitudinal cross-sectional view of the slider for slide fastener shown in FIG. 1;

FIG. 3 is a longitudinal cross-sectional view of the slider for slide fastener shown in FIG. 2 in the state in which the cover member is pulled up by the pull-tab;

FIG. 4 is a lateral cross-sectional view taken along the portion where the latching protrusions and the latching step portions of the front-side post section are latched together;

FIG. 5 is a longitudinal cross-sectional view illustrating the contact state between the elastic piece and the bottom surface of the elastic piece receiving portion shown in FIG. 4;

FIG. 6 is a longitudinal cross-sectional view illustrating the state in which the body shown in FIG. 2 is molded with a mold;

FIG. 7 is a cross-sectional view taken along line A-A in FIG 6;

FIG. 8 is an exploded perspective view illustrating a second embodiment of the slider for slide fastener according to the invention;

FIG. 9 is a longitudinal cross-sectional view of the slider for slide fastener shown in FIG. 8;

FIG. 10 is a longitudinal cross-sectional view of the slider for slide fastener shown in FIG. 9 in the state in which the cover member is pulled up by the pull-tab;

FIG. 11 is a front elevation view of the surroundings of the front-side post section of the slider for slide fastener shown in FIG. 8;

FIG. 12 is a longitudinal cross-sectional view illustrating the state in which the body shown in FIG 9 is molded with a mold;

FIG. 13 is an enlarged perspective view of key parts illustrating a modified embodiment of the slider for slide fastener of the second embodiment;

FIG. 14 is an exploded perspective view illustrating a third embodiment of a slider for slide fastener according to the invention;

FIG. 15 is a longitudinal view of the slider for slide fastener shown in FIG. 14; and

FIG. 16 is a longitudinal view illustrating the state in which the body shown in FIG. 15 is molded with a mold.

## Embodiments of Invention

**[0011]** Hereinafter, a slider for slide fastener according to each embodiment of the present invention will be described in detail with reference to the accompanying

drawings. In the following description, an upper side refers to an upper side with respect to the paper surface of FIG. 2, a lower side refers to a lower side with respect to the paper surface of FIG. 2, a front side refers to a right side with respect to the paper surface of FIG. 2, a rear side refers to a left side with respect to the paper surface of FIG. 2, a right side refers to a near side with respect to the paper surface of FIG. 2, and a left side refers to a depth side with respect to the paper surface of FIG. 2. In addition, the left-right direction of the slider is also referred to as a lateral direction.

[First Embodiment]

**[0012]** A first embodiment of the slide fastener according to the present invention will be described first with reference to FIG. 1 to FIG 7.

**[0013]** The slider for slide fastener 10 according to this embodiment is a slider having an automatic stop function. As shown in FIG. 1 and FIG. 2, the slider 10 has a body 20 which has an element guide path 27 which extends through the inside of the body 20 in the front-rear direction. Describing in detail, the body 20 includes upper and lower blades 21 and 22 which are arranged in parallel so as to be spaced apart from each other in the upward and downward direction, a guide post 23 which connects the front end portion of the upper blade 21 to the front end portion of the lower blade 22, upper flanges 24a which protrude downward along right and left side edges of the upper blade 21, and lower flanges 24b which protrude upward along right and left side edges of the lower blade 22. Due to this, right and left shoulder mouths 25 which are divided by the guide post 23 are formed in the front portion of the body 20, and a rear mouth 26 is formed in the rear portion of the body 20. In addition, a substantially Y-shaped element guide path 27 which allows the right and left shoulder mouths 25 and the rear mouth 26 to communicate with each other is formed between the upper and lower blades 21 and 22. This element guide path 27 forms a passage through which fastener element rows (not shown) are inserted.

**[0014]** A front-side post section 30 and a rear-side post section 40 are respectively erected on the front end portion and the rear end portion of the upper surface of the upper blade 21. A cover member 50 is supported on the front-side post section 30 and the rear-side post section 40 so as to rock in the upward and downward direction. In addition, in the slider 10 according to this embodiment, after a shaft portion 11a of a pull-tab 11 is set between the front-side post section 30 and the rear-side post section 40 of the body 20, when the cover member 50 is fitted around the front-side post section 30 and the rear-side post section 40, the shaft portion 11a of the pull-tab 11 is covered from above by the cover member 50 and is situated between the upper surface of the upper blade 21 and the cover member 50. Consequently, the pull-tab 11 is attached to the body 20.

**[0015]** The cover member 50 is made by bending one sheet of plate member, and as shown in FIG. 1 and FIG. 2, has a rectangular top plate 51 which extends in the front-rear direction and a pair of right and left side plates 52 which extend downward from both side edges of the top plate 51. The cover member 50 also has pull-tab receiving recesses 53, a hook 54 and an elastic piece 55. The pull-tab receiving recesses 53 are respectively formed in the pair of right and left side plates 52, are recessed upward, and receive the shaft portion 11a of the pull-tab 11. The hook 54 extends downward from the portion of the right side plate 52 that is behind the pull-tab receiving recesses 53, and enters the element guide path 27 through the hook hole 21a formed in the upper blade 21. The elastic piece 55 extends forward from the front end portion of the top plate 51, the leading end of the elastic piece 55 being bent downward, and urges the cover member 50 so that the hook 54 enters the element guide path 27. In addition, the cover member 50 also has a pair of right and left front-side engagement pieces 56 and a pair of right and left rear-side engagement pieces 57. The pair of right and left front-side engagement pieces 56 respectively extend forward from the front end portions of the pair of right and left side plates 52, and engage with the front-side post section 30. The pair of right and left rear-side engagement pieces 57 respectively extend rearward from the rear end portions of the pair of right and left side plates 52, and engage with the rear-side post section 40. In addition, the hook hole 21a extends in a penetrating fashion from the upper surface of the upper blade 21 to the element guide path 27. In addition, the elastic piece 55 urges the cover member 50 rearward and downward through contact with an elastic piece receiving portion 33 which will be described later.

**[0016]** Front-side engagement recesses 31 with which the pair of right and left front-side engagement pieces 56 of the cover member 50 engage are respectively formed in right and left side surfaces of the front-side post section 30. The front-side engagement recess 31 in the left side surface of the front-side post section 30 is opened to the left of the body 20, and the front-side engagement recess 31 in the right side surface of the front-side post section 30 is opened to the right of the body 20. In addition, since the front-side engagement recesses 31 are respectively formed in a penetrating fashion in the front-rear direction of the body 20, the front-side engagement recesses 31 are respectively opened in the front-rear direction of the body 20. In addition, the upper surfaces of the front-side engagement recesses 31 respectively form engagement surfaces 31a. The engagement surfaces 31a are the surfaces that respectively face the upper surfaces 56a of the front-side engagement pieces 56, and abut to the upper surfaces 56a of the front-side engagement pieces 56 so as to prevent the cover member 50 from moving upward.

**[0017]** In addition, protrusions 32 which protrude outward in the lateral direction of the body 20 are respectively formed on the front end sides of the front-side post section 30 that are also the upper ends of the right and

left side surfaces of the front-side post section 30. The outer surfaces of the protrusions 32 form slope surfaces 32a which are inclined downward to the bottom from the upper end the front-side post section 30. When the cover member 50 is fitted around the front-side post section 30, the pair of right and left front-side engagement pieces 56 climb on the slope surfaces 32a. In addition, the protrusions 32 are configured such that their thickness in the lateral direction gradually increases in the direction from the upper end to the bottom of the front-side post section 30 in order to form the engagement surfaces 31a of the front-side engagement recesses 31.

**[0018]** In addition, the front surfaces of the right and left protrusions 32 are surfaces that continue from the front surface of the front-side post section 30. In addition, the rear surfaces 32b of the protrusions 32 and the front end surfaces 52a of the right and left side plates 52 of the cover member 50 face each other in the front-rear direction of the body 20. Furthermore, the cover member 50 is prevented from moving forward through contact between the rear surfaces of the protrusions 32 and the front end surfaces 52a of the side plates 52.

**[0019]** In addition, an elastic piece receiving portion 33 is formed in the front surface of the front-side post section 30. The elastic piece receiving portion 33 extends forward and downward from the upper end portion of the front-side post section 33 to the front surface of the guide post 23, receives the elastic piece 55 of the cover member 50, and has a concave shape that is opened forward. The elastic piece receiving portion 33 has a bottom surface 33a, a pair of right and left side surfaces 33b which extend forward from right and left end edges of the bottom surface 33a, and a lower end surface 33c which extends forward from the lower end edge of the bottom surface 33a.

**[0020]** In addition, when the cover member 50 is fitted around the front-side post section 30, as shown in FIG. 4 and FIG. 5, the front end surfaces 52a of the right and left side plates 52 come into contact with the rear surfaces 32b of the right and left protrusions 32, and concurrently, the elastic piece 55 comes into contact with the bottom surface 33a of the elastic piece receiving portion 33. Consequently, the front-side post section 30 is sandwiched in the front-rear direction by the front end surfaces 52a of the right and left side plates 52 and the elastic piece 55, so that the place where the cover member 50 is attached to the body 20 (front-side post section 30) is positioned.

**[0021]** In addition, also in this embodiment, as shown in FIG. 1, FIG. 2 and FIG 4, latching step portions 34 which are recessed upward are respectively formed in the front portions of the engagement surfaces 31a of the right and left front-side engagement recesses 31, and latching protrusions 58 are respectively formed on the upper surfaces of the front ends of the pair of right and left front-side engagement pieces 56. The latching protrusions 58 protrude upward so as to latch to the latching step portions 34.

**[0022]** Each of the latching step portions 34 has an engagement surface 34a and a stopper surface 34b. The engagement surface 34a faces a corresponding upper surface of the latching protrusions 58. The stopper surface 34b is the surface that faces a corresponding rear surface of the latching protrusions 58, and abuts to the rear surface of the latching protrusions 58 so as to prevent the cover member 50 from moving rearward. In addition, the surfaces engagement is not the surface that engages with a corresponding latching protrusion 58 but is configured so as to avoid contact (interference) with the latching protrusion 58. In addition, as shown in FIG. 3, when the cover member 50 is pulled up by the pull-tab 11, the cover member 50 rotates about the points of contact between the front end surfaces 52a of the right and left side plates 52 and the rear surfaces 32b of the right and left protrusions 32 of the front-side post section 30. In addition, since the front end portions of the latching step portions 34 are opened forward, they can be formed by a slide core K3 which moves in the front-rear direction of the body 20 (see FIG. 6).

**[0023]** In addition, as shown in FIG. 2, the upper surfaces of the front-side engagement pieces 56 are formed as inclined surfaces that are inclined downward from the leading end side to the base end side. Therefore, when the cover member 50 is attached to the body 20, the engagement surfaces 31a of the front-side engagement recesses 31 are horizontal surfaces that are parallel to the front-rear direction of the body 20, whereas the upper surfaces 56a of the front-side engagement pieces 56 are inclined downward in the direction from the front side to the rear side of the body 20. That is, the gaps between the engagement surfaces 31a of the front-side engagement recesses 31 and the upper surfaces 56a of the front-side engagement pieces 56 gradually increase in the direction from the front side to the rear side of the body 20. Due to this, when the cover member 50 rotates, the front-side engagement pieces 56 move upward while reducing the gaps between the engagement surfaces 31a and the upper surfaces 56a of the front-side engagement pieces 56. Consequently, the front-side engagement pieces 56 do not interfere with the engagement surfaces 31a.

**[0024]** Rear-side engagement recesses 41 are respectively formed on the right and left side surfaces of the rear-side post section 40. The pair of right and left rear-side engagement pieces 57 of the cover member 50 engage with the rear-side engagement recesses 41. The rear-side engagement recess 41 in the left side surface of the rear-side post section 40 is opened to the left of the body 20, and the rear-side engagement recess 41 in the right side surface of the rear-side post section 40 is opened to the right of the body 20. In addition, since the rear-side engagement recesses 41 are respectively formed in a penetrating fashion in the front-rear direction of the body 20, the rear-side engagement recesses 41 are respectively opened in the front-rear direction of the body 20. In addition, the upper surfaces of the rear-side engagement recesses 41 respectively form engagement

surfaces 41a. The engagement surfaces 41a are the surfaces that respectively face the upper surfaces of the rear-side engagement pieces 57, and abut to the upper surfaces of the front-side engagement pieces 57 so as to prevent the cover member 50 from moving upward.

**[0025]** In addition, a guide portion 42 is formed on the left end of the front surface of the rear-side post section 40 so as to extend forward, and has a triangular shape when viewed from the side. When the pull-tab 11 is pulled up, the guide portion 42 allows the shaft portion 11a of the pull-tab 11 to climb thereon and guides the movement (upward movement) of the shaft portion 11a. The guide portion 42 serves to move the cover member 50 upward by guiding the movement of the shaft portion 11 a.

**[0026]** In the slider for slide fastener 10 as configured above, as shown in FIG. 6 and FIG. 7, it is possible to produce a plurality of bodies 20 in which the front-side and rear-side engagement recesses 31 and 41 and the latching step portions 34 are formed in a single casting process using an upper mold K1, a lower mold (not shown) and front and rear slide cores K3 and K4 which move in the front-rear direction of the body 20. In addition, since the latching protrusions 58 of the cover member 50 are latched to the latching step portions 34 of the front-side post section 30, the cover member 50 is prevented from moving rearward.

**[0027]** In addition, the upper mold K1 and the front and rear slide cores K3 and K4 cooperate to mold the front-side post section 30 and rear-side post section 40 provided on the upper surface of the body 20. The front and rear slide cores K3 and K4 can move toward and away from each other along the lower surface of the upper mold K1. The front and rear slide cores K3 and K4 move toward each other when the body 20 is being molded. After the body 20 is molded, the front and rear slide cores K3 and K4 move away from each other. The front slide core K3 has a first molding recess K31 in the leading end thereof, and a portion of the front surface of the front-side post section 30, a portion of the left surface of the front-side post section 30 and a portion of the right surface of the front-side post section 30 are molded in the first molding recess K31 (see FIG. 7). The rear slide core K4 has a second molding recess K41 in the leading end thereof, and a portion of the rear surface of the rear-side post section 40, a portion of the left surface of the rear-side post section 40 and a portion of the right surface of the rear-side post section 40 are molded in the rear slide core K4 (see FIG. 7). In addition, the front slide core K3 has a step portion K32 on the upper surface of the leading end portion, the step portion K32 being recessed downward (see FIG. 6). Due to this, the engagement surfaces 34a of the latching step portions 34 are molded in the upper surface of the slide core K3, and the engagement surfaces 31 a of the front-side engagement recesses 31 and the stopper surfaces 34b of the latching step portions 34 are molded in the step portion K32. In addition, the guide portion 42 and the hook hole 21a are molded by the upper mold K1 alone.

**[0028]** As described above, in the slider for slide fastener 10 according to this embodiment, since the front-side and rear-side engagement recesses 31 and 41 are formed to penetrate through the body 20 in the front-rear direction, the front-side and rear-side engagement recesses 31 and 41 can be formed using the slide core which moves in the front-rear direction of the body 20. It is therefore possible to preclude the slide core which moves in the lateral direction of the body 20 and with which the front-side and rear-side engagement recesses 31 and 41 are formed. Due to this, a plurality of bodies 20 can be produced in a single casting process, thereby reducing the manufacturing cost of the slider 10.

**[0029]** In addition, in the slider for slide fastener 10 according to this embodiment, the latching step portions 34 are respectively formed on the right and left surfaces of the front-side post section 30, and the latching protrusions 58 which are latched to the latching step portions 34 are respectively formed on the pair of right and left front-side engagement pieces 56. Thus, it is possible to prevent the cover member 50 from moving rearward through latching between the latching step portions 34 and the latching protrusions 58. This can consequently prevent metal fatigue in the elastic piece 55 of the cover member 50.

[Second Embodiment]

**[0030]** Next, with reference to FIG. 8 to FIG. 13, a description will be given below of a second embodiment of the slider for slide fastener according to the invention. In addition, the same reference numerals and signs will be used in the drawings in order to designate some components when they are the same as or similar to those of the first embodiment, and descriptions of those components will be omitted or simplified.

**[0031]** In this embodiment, as shown in FIG. 8, FIG. 9 and FIG. 11, instead of the latching step portions 34 and the latching protrusions 58 of the first embodiment, latching step portions 61 which are recessed downward are respectively formed in the upper blade 21 which forms the lower surfaces of the right and left front-side engagement recesses 31 and latching protrusions 62 which protrude downward are respectively formed on the lower surfaces of the front ends of the pair of right and left front-side engagement pieces 56. The latching protrusions 62 are latched to the latching step portions 61.

**[0032]** The front-side engagement recesses 31 with which the pair of right and left front-side engagement pieces 56 of the cover member 50 engage are respectively formed on the right and left side surfaces of the front-side post section 30. The front-side engagement recesses 31 on the left side surface of the front-side post section 30 are opened to the left of the body 20, and the front-side engagement recesses 31 on the right side surface of the front-side post section 30 are opened to the right of the body 20. In addition, since the front-side engagement recesses 31 are respectively formed in a pen-

etrating fashion in the front-rear direction of the body 20, the front-side engagement recesses 31 are respectively opened in the front-rear direction of the body 20. In addition, the upper surfaces of the front-side engagement recesses 31 respectively form engagement surfaces 31a. The engagement surfaces 31 a are the surfaces that respectively face the upper surfaces 56a of the front-side engagement pieces 56, and abut to the upper surfaces 56a of the front-side engagement pieces 56 so as to prevent the cover member 50 from moving upward.

**[0033]** Each of the latching step portions 61 has a bottom surface 61a and a stopper surface 61b. The bottom surface 61a is the surface that faces a corresponding lower surface of the latching protrusions 62. The stopper surface 61b is the surface that faces a corresponding rear surface of the latching protrusions 62, and abuts to the rear surface of the latching protrusions 62so as to prevent the cover member 50 from moving rearward. In addition, as shown in FIG. 10, when the cover member 50 is pulled up by the pull-tab 11, the cover member 50 rotates about the points of contact between the front end surfaces 52a of the right and left side plates 52 and the rear surfaces 32b of the right and left protrusions 32 of the front-side post section 30. In addition, although there are gaps between the latching protrusions 62 and the stopper surfaces 61 b before rotation of the cover member 50, the latching protrusions 62 approach and abut to the stopper surfaces 61b when the cover member 50 rotates upward. In addition, since the front end portions of the latching step potions 61 are opened forward, they can be formed by a slide core K3 which moves in the front-rear direction of the body 20 (see FIG. 12).

**[0034]** In the slider for slide fastener 10 as configured above, as shown in FIG. 12, it is possible to produce a plurality of bodies 20 in which the front-side and rear-side engagement recesses 31 and 41 and the latching step portions 34 are formed in a single casting process using an upper mold K1, a lower mold (not shown) and front and rear slide cores K3 and K4 which move in the front-rear direction of the body 20. In addition, since the latching protrusions 62 of the cover member 50 are latched to the latching step portions 61 of the front-side post section 30, the cover member 50 is prevented from moving rearward.

**[0035]** In addition, the upper mold K1 and the front and rear slide cores K3 and K4 cooperate to mold the front-side post section 30 and rear-side post section 40 provided on the upper surface of the body 20. The front and rear slide cores K3 and K4 can move toward and away from each other along the lower surface of the upper mold K1. The front and rear slide cores K3 and K4 move toward each other when the body 20 is being molded. After the body 20 is molded, the front and rear slide cores K3 and K4 move away from each other. In addition, the front slide core K3 has an upwardly-recessed step portion K32 in the lower surface of the leading end portion (see FIG. 12). Due to this, the bottom surfaces 61a of the latching step portions 61 are molded in the lower surface of the slide core K3, and the lower surfaces of the front-side engagement recesses 31 and the stopper surfaces 61b of the latching step portions 61 are molded in the step portion K32. In addition, the guide portion 42 and the hook hole 21a are molded by the upper mold K1 alone.

**[0036]** As described above, in the slider for slide fastener 10 according to this embodiment, the latching step portions 61 are respectively formed on the upper blade 21 which forms the lower surface of the right and left front-side engagement recesses 31, and the latching protrusions which are latched to the latching step portions 61 are respectively formed on the pair of right and left front-side engagement pieces 56. Thus, it is possible to prevent the cover member 50 from moving rearward through latching between the latching step portions 61 and the latching protrusions 52. This can consequently prevent metal fatigue in the elastic piece 55 of the cover member 50.

**[0037]** The other configurations, operations and effects are the same as those of the first embodiment.

**[0038]** In addition, according to a modified embodiment of this embodiment, as shown in FIG. 13, the latching step portions 61 may be formed in a penetrating fashion not only at the position adjacent to the side surfaces of the front-side post section 30 but also outward in the lateral direction of the upper blade 21. Therefore, in this case, the latching step portions 61 are opened forward and outward.

[Third Embodiment]

**[0039]** Next, with reference to FIG. 14 to FIG. 16, a description will be given below of a third embodiment of the slider for slide fastener according to the invention.

**[0040]** The slider for slide fastener 10 according to this embodiment is a slider having an automatic stop function. As shown in FIG. 14 and FIG. 15, the slider 10 has a body 20 which has an element guide path 27 which extends through the inside of the body 20 in the front-rear direction. Describing in detail, the body 20 includes upper and lower blades 21 and 22 which are arranged in parallel so as to be spaced apart from each other in the upward and downward direction, a guide post 23 which connects the front end portion of the upper blade 21 to the front end portion of the lower blade 22, upper flanges 24a which protrude downward along right and left side edges of the upper blade 21, and lower flanges 24b which protrude upward along right and left side edges of the lower blade 22. Due to this, right and left shoulder mouths 25 which are divided by the guide post 23 are formed in the front portion of the body 20, and a rear mouth 26 is formed in the rear portion of the body 20. In addition, a substantially Y-shaped element guide path 27 which allows the right and left shoulder mouths 25 and the rear mouth 26 to communicate with each other is formed between the upper and lower blades 21 and 22. This element guide path 27 forms a passage through which fastener element

rows (not shown) are inserted.

**[0041]** A front-side post section 30 and a rear-side post section 40 are respectively erected on the front end portion and the rear end portion of the upper surface of the upper blade 21. A cover member 50 is supported on the front-side post section 30 and the rear-side post section 40 so as to rock in the upward and downward direction. In addition, in the slider 10 according to this embodiment, after a shaft portion 11a of a pull-tab 11 is set between the front-side post section 30 and the rear-side post section 40 of the body 20, when the cover member 50 is fitted around the front-side post section 30 and the rear-side post section 40, the shaft portion 11a of the pull-tab 11 is covered from above by the cover member 50 and is situated between the upper surface of the upper blade 21 and the cover member 50. Consequently, the pull-tab 11 is attached to the body 20.

**[0042]** The cover member 50 is made by bending one sheet of plate member, and as shown in FIG. 14 and FIG. 15, has a rectangular top plate 51 which extends in the front-rear direction and a pair of right and left side plates 52 which extend downward from both side edges of the top plate 51. The cover member 50 also has pull-tab receiving recesses 53, a hook 54 and an elastic piece 55. The pull-tab receiving recesses 53 are respectively formed in the pair of right and left side plates 52, are recessed upward, and receive the shaft portion 11a of the pull-tab 11. The hook 54 extends downward from the portion of the right side plate 52 that is behind the pull-tab receiving recesses 53, and enters the element guide path 27 through the hook hole 21a formed in the upper blade 21. The elastic piece 55 extends forward from the front end portion of the top plate 51, the leading end of the elastic piece 55 being bent downward, and urges the cover member 50 so that the hook 54 enters the element guide path 27. In addition, the cover member 50 also has a pair of right and left front-side engagement pieces 56 and a pair of right and left rear-side engagement pieces 57. The pair of right and left front-side engagement pieces 56 respectively extend forward from the front end portions of the pair of right and left side plates 52, and engage with the front-side post section 30. The pair of right and left rear-side engagement pieces 57 respectively extend rearward from the rear end portions of the pair of right and left side plates 52, and engage with the rear-side post section 40. In addition, the hook hole 21a extends in a penetrating fashion from the upper surface of the upper blade 21 to the element guide path 27. In addition, the elastic piece 55 urges the cover member 50 rearward and downward through contact with an elastic piece receiving portion 33 which will be described later.

**[0043]** Front-side engagement recesses 31 with which the pair of right and left front-side engagement pieces 56 of the cover member 50 engage are respectively formed in right and left side surfaces of the front-side post section 30. The front-side engagement recess 31 in the left side surface of the front-side post section 30 is opened to the left of the body 20, and the front-side engagement recess 31 in the right side surface of the front-side post section 30 is opened to the right of the body 20. In addition, since the front-side engagement recesses 31 are formed in a penetrating fashion in the front-rear direction of the body 20, the front-side engagement recesses 31 are respectively opened in the front-rear direction of the body 20. In addition, the upper surfaces of the front-side engagement recesses 31 respectively form engagement surfaces 31a. The engagement surfaces 31a are the surfaces that respectively face the upper surfaces 56a of the front-side engagement pieces 56, and abut to the upper surfaces 56a of the front-side engagement pieces 56 so as to prevent the cover member 50 from moving upward.

**[0044]** In addition, protrusions 32 which protrude outward in the lateral direction of the body 20 are respectively formed on the front end sides of the front-side post section 30 that are also the upper ends of the right and left side surfaces of the front-side post section 30. The outer surfaces of the protrusions 32 form slope surfaces 32a which are inclined downward to the bottom from the upper end the front-side post section 30. When the cover member 50 is fitted around the front-side post section 30, the pair of right and left front-side engagement pieces 56 climb on the slope surfaces 32a. In addition, the protrusions 32 are configured such that their thickness in the lateral direction gradually increases in the direction from the upper end to the bottom of the front-side post section 30 in order to form the engagement surfaces 31a of the front-side engagement recesses 31.

**[0045]** In addition, the front surfaces of the right and left protrusions 32 are surfaces that continue from the front surface of the front-side post section 30. In addition, the rear surfaces 32b of the protrusions 32 and the front end surfaces 52a of the right and left side plates 52 of the cover member 50 face each other in the front-rear direction of the body 20. Furthermore, the cover member 50 is prevented from moving forward through contact between the rear surfaces of the protrusions 32 and the front end surfaces 52a of the side plates 52.

**[0046]** In addition, an elastic piece receiving portion 33 is formed in the front surface of the front-side post section 30. The elastic piece receiving portion 33 extends forward and downward from the upper end portion of the front-side post section 33 to the front surface of the guide post 23, receives the elastic piece 55 of the cover member 50, and has a concave shape that is opened forward. The elastic piece receiving portion 33 has a bottom surface 33a, a pair of right and left side surfaces 33b which extend forward from right and left end edges of the bottom surface 33a, and a lower end surface 33c which extends forward from the lower end edge of the bottom surface 33a.

**[0047]** In addition, when the cover member 50 is fitted around the front-side post section 30, the front end surfaces 52a of the right and left side plates 52 come into contact with the rear surfaces 32b of the right and left protrusions 32, and concurrently, the elastic piece 55 comes into contact with the bottom surface 33a of the

elastic piece receiving portion 33. Consequently, the front-side post section 30 is sandwiched in the front-rear direction by the front end surfaces 52a of the right and left side plates 52 and the elastic piece 55, so that the place where the cover member 50 is attached to the body 20 (front-side post section 30) is positioned.

**[0048]** In addition, as shown in FIG. 15, the upper surfaces 56a of the front-side engagement pieces 56 are formed as inclined surfaces that are inclined downward from the leading end side to the base end side. Therefore, when the cover member 50 is attached to the body 20, the engagement surfaces 31a of the front-side engagement recesses 31 are horizontal surfaces that are parallel to the front-rear direction of the body 20, whereas the upper surfaces 56a of the front-side engagement pieces 56 are inclined downward in the direction from the front side to the rear side of the body 20. That is, the gaps between the engagement surfaces 31a of the front-side engagement recesses 31 and the upper surfaces 56a of the front-side engagement pieces 56 gradually increase in the direction from the front side to the rear side of the body 20. Due to this, when the cover member 50 rotates, the front-side engagement pieces 56 move upward while reducing the gaps between the engagement surfaces 31a and the upper surfaces 56a of the front-side engagement pieces 56. Consequently, the front-side engagement pieces 56 do not interfere with the engagement surfaces 31a.

**[0049]** Rear-side engagement recesses 41 are respectively formed on the right and left side surfaces of the rear-side post section 40. The pair of right and left rear-side engagement pieces 57 of the cover member 50 engage with the rear-side engagement recesses 41. The rear-side engagement recess 41 in the left side surface of the rear-side post section 40 is opened to the left of the body 20, and the rear-side engagement recess 41 in the right side surface of the rear-side post section 40 is opened to the right of the body 20. In addition, since the rear-side engagement recesses 41 are respectively formed in a penetrating fashion in the front-rear direction of the body 20, the rear-side engagement recesses 41 are respectively opened in the front-rear direction of the body 20. In addition, the upper surfaces of the rear-side engagement recesses 41 respectively form engagement surfaces 41a. The engagement surfaces 41 a are the surfaces that respectively face the upper surfaces of the rear-side engagement pieces 57, and abut to the upper surfaces of the front-side engagement pieces 57 so as to prevent the cover member 50 from moving upward.

**[0050]** In addition, a guide portion 42 is formed on the left end of the front surface of the rear-side post section 40 so as to extend forward, and has a triangular shape when viewed from the side. When the pull-tab 11 is pulled up, the guide portion 42 allows the shaft portion 11a of the pull-tab 11 to climb thereon and guides the movement (upward movement) of the shaft portion 11a. The guide portion 42 serves to move the cover member 50 upward by guiding the movement of the shaft portion 11a.

**[0051]** In the slider for slide fastener 10 as configured above, as shown in FIG. 16, it is possible to produce a plurality of bodies 20 in which the front-side and rear-side engagement recesses 31 and 41 are formed in a single casting process using an upper mold K1, a lower mold (not shown) and front and rear slide cores K3 and K4 which move in the front-rear direction of the body 20.

**[0052]** In addition, the upper mold K1 and the front and rear slide cores K3 and K4 cooperate to mold the front-side post section 30 and rear-side post section 40 provided on the upper surface of the body 20. The front and rear slide cores K3 and K4 can move toward and away from each other along the lower surface of the upper mold K1. The front and rear slide cores K3 and K4 move toward each other when the body 20 is being molded. After the body 20 is molded, the front and rear slide cores K3 and K4 move away from each other.

**[0053]** As described above, in the slider for slide fastener 10 according to this embodiment, since the front-side and rear-side engagement recesses 31 and 41 are formed to penetrate through the body 20 in the front-rear direction, the front-side and rear-side engagement recesses 31 and 41 can be formed using the slide core which moves in the front-rear direction of the body 20. It is therefore possible to preclude the slide core which moves in the lateral direction of the body 20 and with which the front-side and rear-side engagement recesses 31 and 41 are formed. Due to this, a plurality of bodies 20 can be produced in a single casting process, thereby reducing the manufacturing cost of the slider 10.

**[0054]** The present invention is not limited to the foregoing embodiments and can be properly modified without departing from the scope of the present invention.

## Description of Reference Numerals

**[0055]**

| | |
|---|---|
| 10 | Slider For Slide Fastener |
| 11 | Pull-Tab |
| 11a | Shaft Portion |
| 20 | Body |
| 21 | Upper Blade |
| 21a | Hook Hole |
| 27 | Element Guide Path |
| 30 | Front-Side Post Section |
| 31 | Front-Side Engagement Recess |
| 31a | Engagement Surface |
| 32 | Protrusion |
| 32b | Rear Surface |
| 33 | Elastic Piece Receiving Portion |
| 32a | Bottom Surface |
| 34 | Latching Step Portion |
| 34a | Engagement Surface |
| 34b | Stopper Surface |
| 40 | Rear-Side Post Section |
| 41 | Rear-Side Engagement Recess |
| 41a | Engagement Surface |

| | |
|---|---|
| 50 | Cover Member |
| 51 | Top Plate |
| 52 | Side Plate |
| 52a | Front End Surface |
| 53 | Pull-Tab Receiving Recess |
| 54 | Hook |
| 55 | Elastic Piece |
| 56 | Front-Side Engagement Piece |
| 57 | Rear-Side Engagement Piece |
| 58 | Latching Protrusion |
| 61 | Latching Step Portion |
| 61a | Bottom Surface |
| 61b | Stopper Surface |
| 62 | Latching Protrusion |

## Claims

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

a body (20); and
a cover member (50) supported on a front-side post section (30) and a rear-side post section (40) which are erected on an upper surface of the body,
wherein the cover member comprises:

a top plate (51);
a pair of right and left side plates (52) which extend downward from both side edges of the top plate;
pull-tab receiving recesses (53) which are respectively formed in the pair of right and left side plates and receive a shaft portion (11a) of a pull-tab (11);
a hook (54) which enters an element guide path of the body through a hook hole (2 1 a) formed in the body;
an elastic piece (55) which extends forward from a front end portion of the top plate, a leading end of the elastic piece being bent downward;
a pair of right and left front-side engagement pieces (56) which respectively extend forward from front end portions of the pair of right and left side plates and engage with the front-side post section;
a pair of right and left rear-side engagement pieces (57) which extend rearward from rear end portions of the pair of right and left side plates and engage with the rear-side post section;
a concavely-shaped elastic piece receiving portion (33) which is formed in a front surface of the front-side post section, the elastic piece receiving portion receiving the elastic piece;
front-side engagement recesses (31) which are respectively formed in right and left side surfaces of the front-side post section, the front-side engagement recesses having surfaces (31a) which face upper surfaces of the front-side engagement pieces; and
rear-side engagement recesses (41) which are respectively formed in right and left side surfaces of the rear-side post section, the rear-side engagement recesses having surfaces (41a) which face upper surfaces of the rear-side engagement pieces, and

wherein the front-side and rear-side engagement recesses are formed so as to penetrate in a front-rear direction of the body.

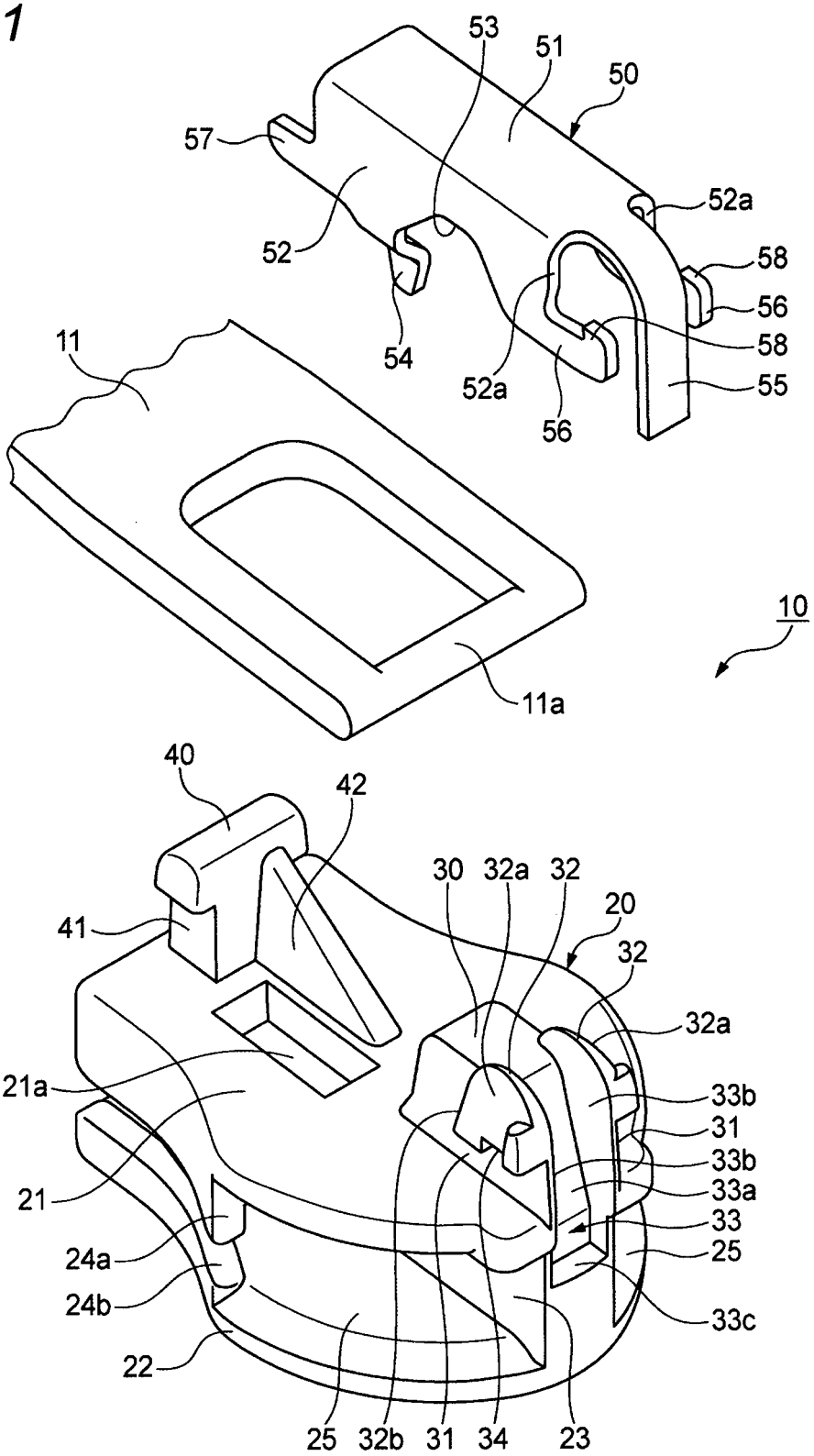
**2.** The slider for slide fastener according to claim 1, wherein protrusions (32) which protrude outward in a lateral direction of the body (20) are respectively formed on right and left side surfaces of the front-side post section (30), and
wherein front end surfaces (52a) of the pair of right and left side plates (52) of the cover member (50) come into contact with rear surfaces (32b) of the protrusions, and the elastic piece (55) comes into contact with the elastic piece receiving portion (33).

**3.** The slider for slide fastener according to claim 1 or 2, wherein a pair of right and left latching step portions (34 and 61) are formed on the body (20), and
wherein latching protrusions (58, 62) which are latched to the latching step portions are respectively formed on the pair of right and left front-side engagement piece (56).

**4.** The slider for slide fastener according to claim 3, wherein the latching step portions (34) which are upwardly-recessed are formed on right and left side surfaces of the front-side post section (30), and
wherein the latching protrusions (58) which protrude upward and are latched to the latching step portions are respectively formed on the pair of right and left front-side engagement pieces (56).

**5.** The slider for slide fastener according to claim 3, wherein the body (20) has an upper blade (21) and a lower blade (22) which are arranged in parallel so as to be spaced apart from each other in an upward and downward direction and a guide post (23) which connects a front end portion of the upper blade to a front end portion of the lower blade,
wherein the pair of right and left latching step portions (61) which are downwardly-recessed are formed in the upper blade, and
wherein the latching protrusions (62) which protrude downward and are latched to the latching step portions are respectively formed on the pair of right and left front-side engagement pieces (56).

FIG.1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32a
21a
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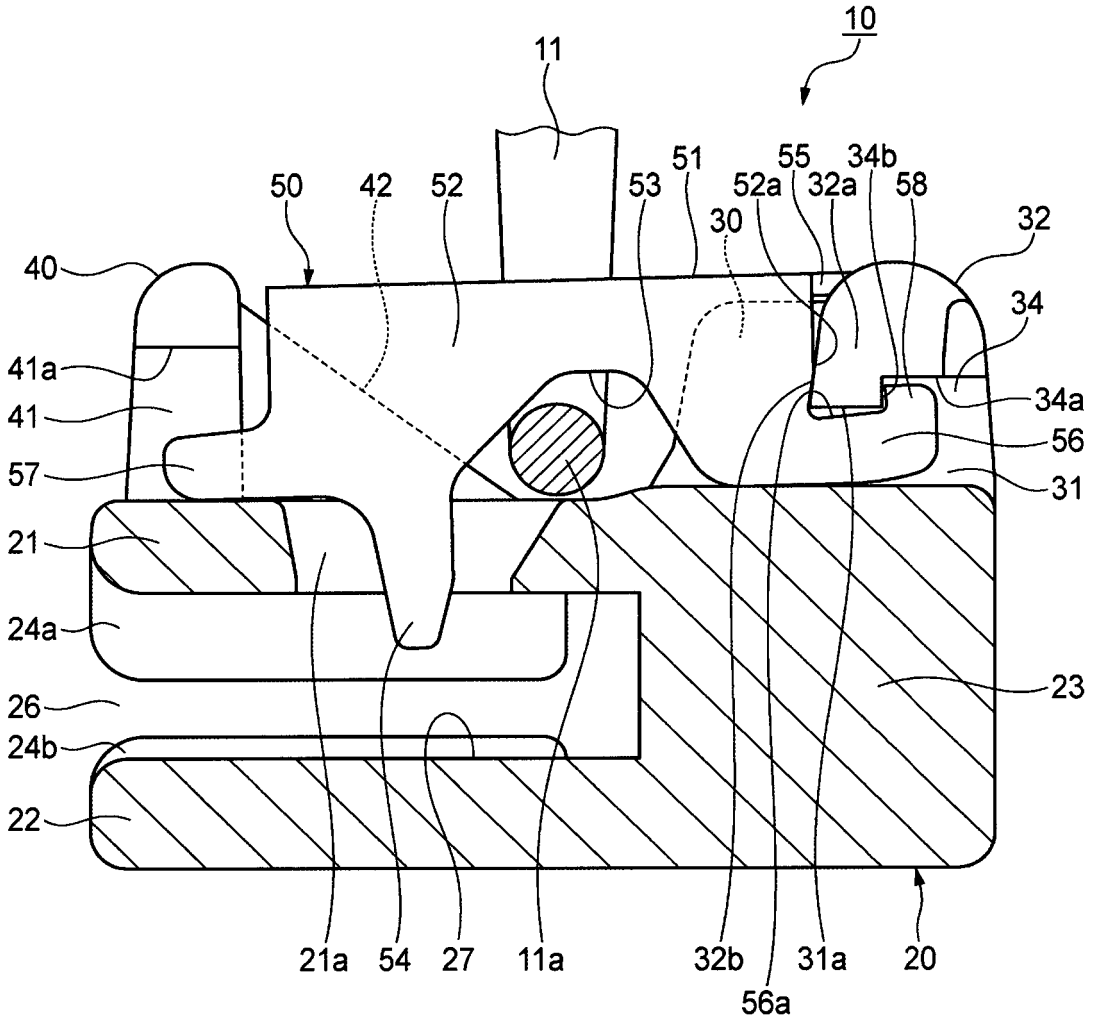
FIG.2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21a
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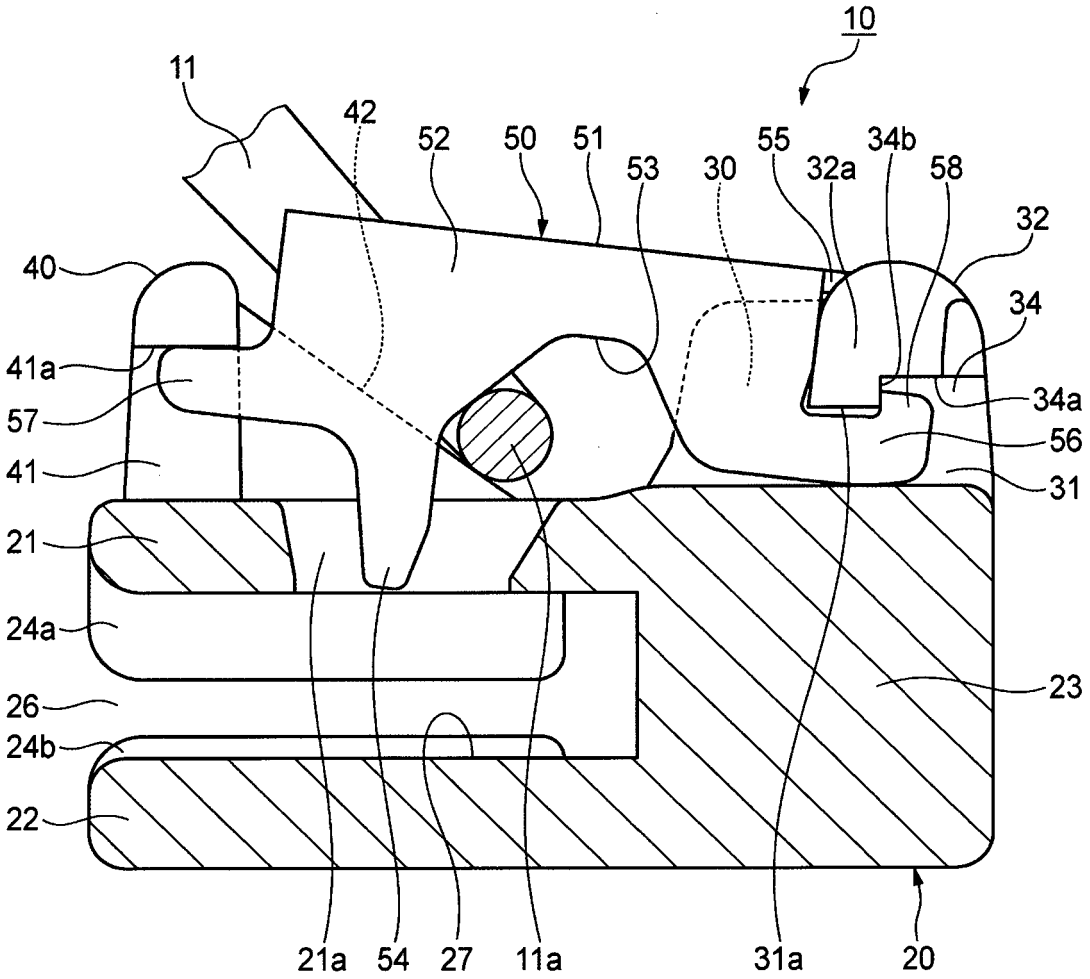
11a
32b
31a
20
56a

FIG.3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11a
31a
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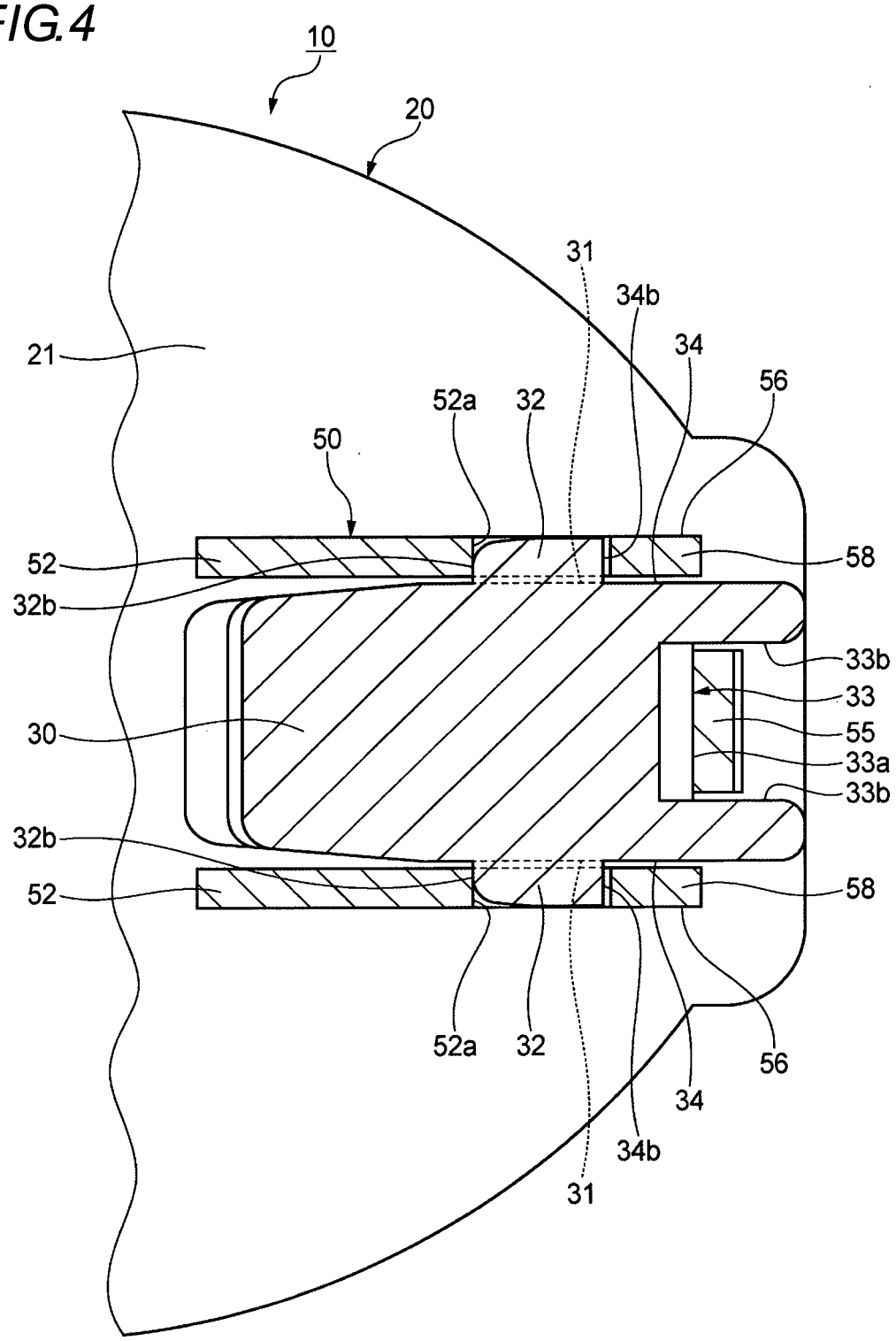
FIG.4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34b
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FIG.5

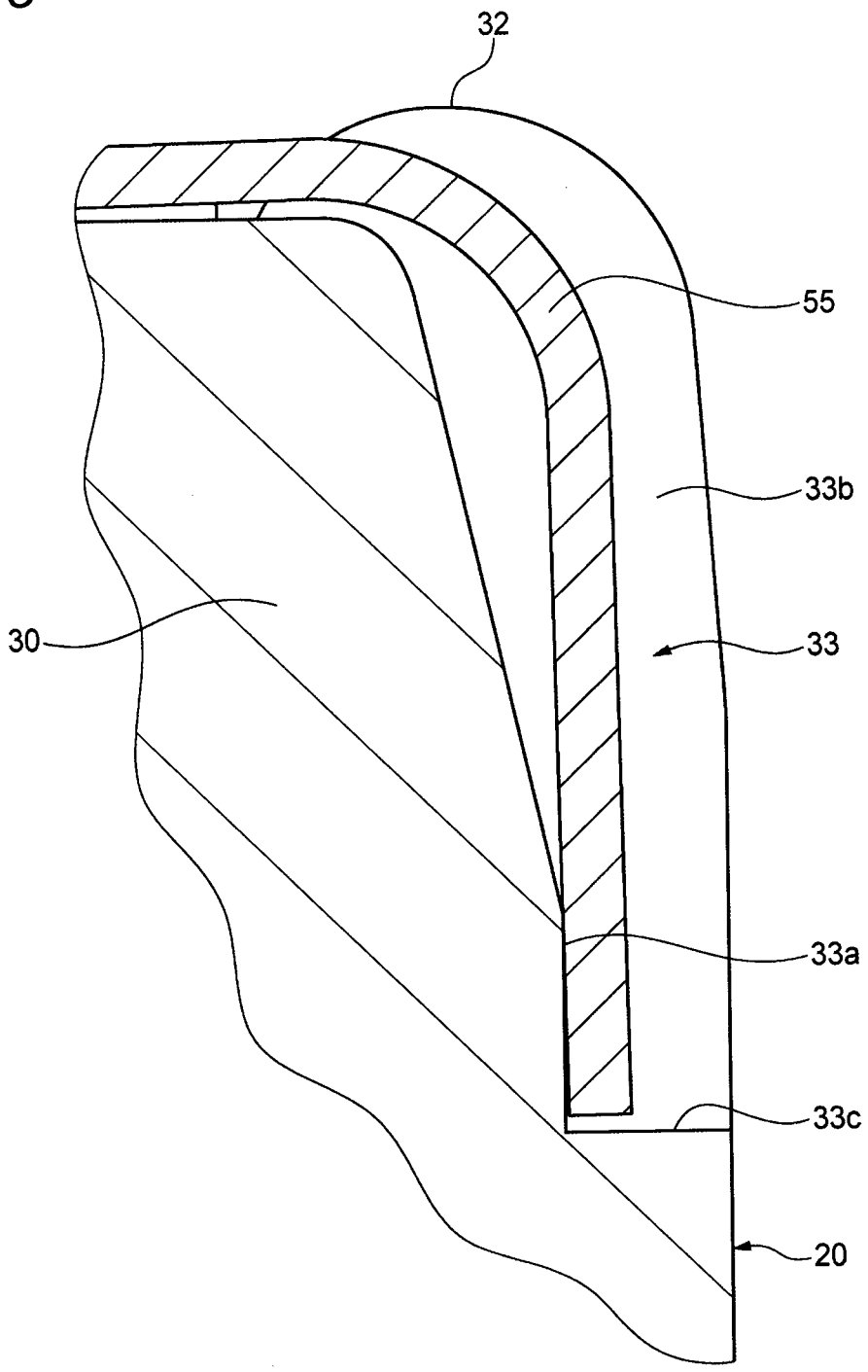
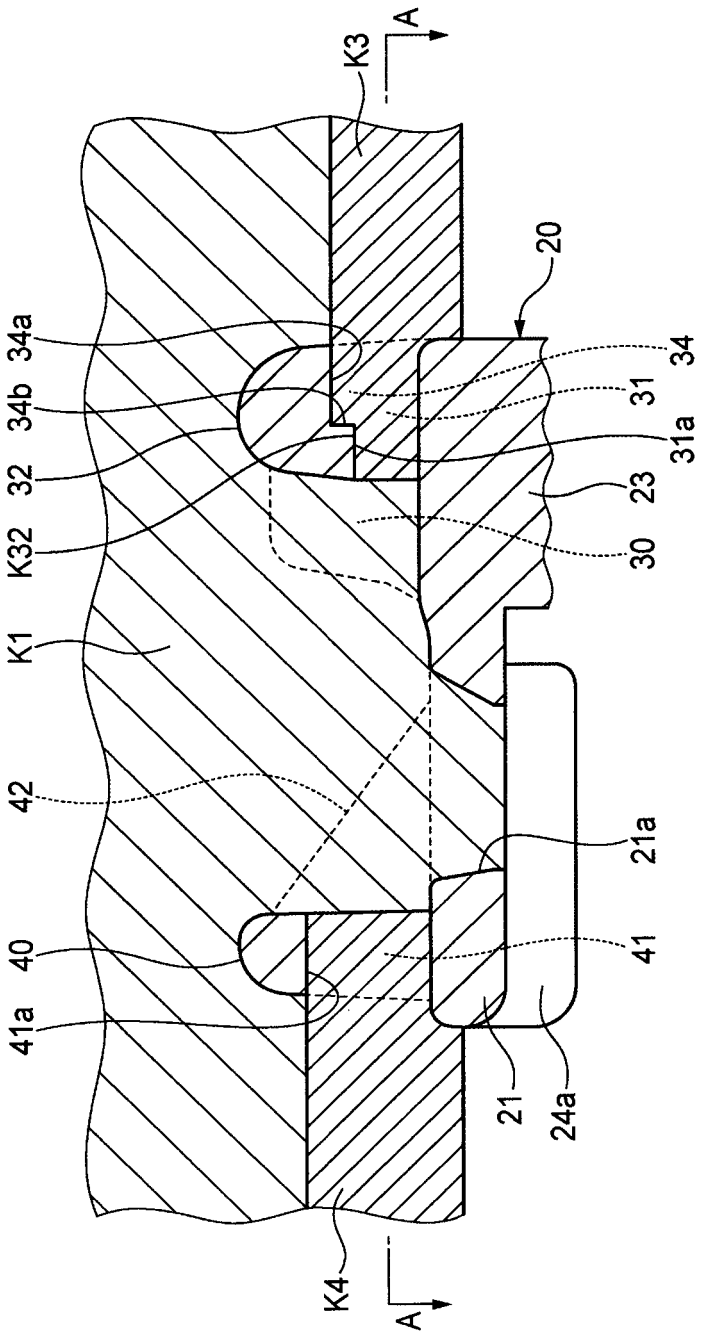


FIG.6



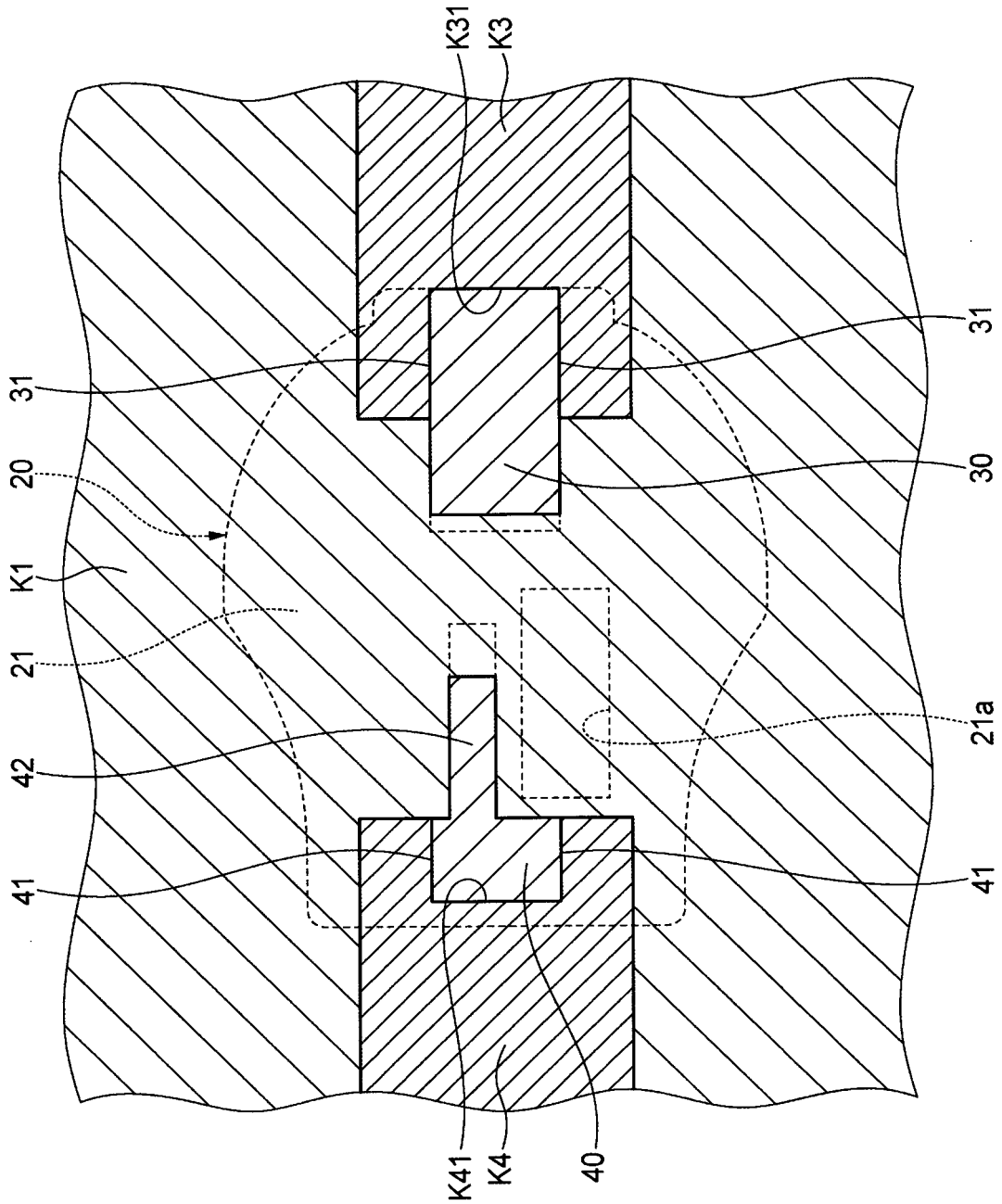
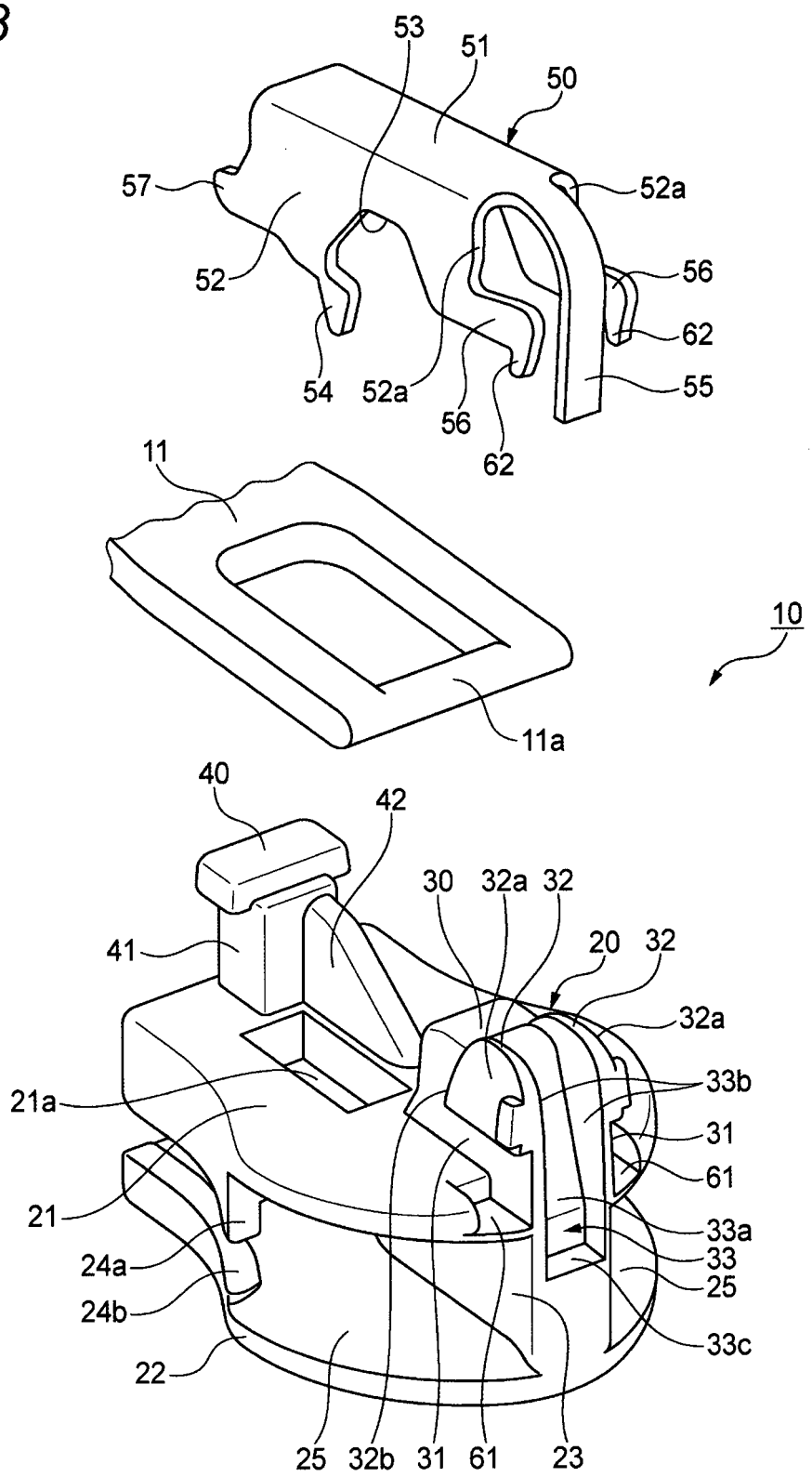



FIG.7

FIG.8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32a
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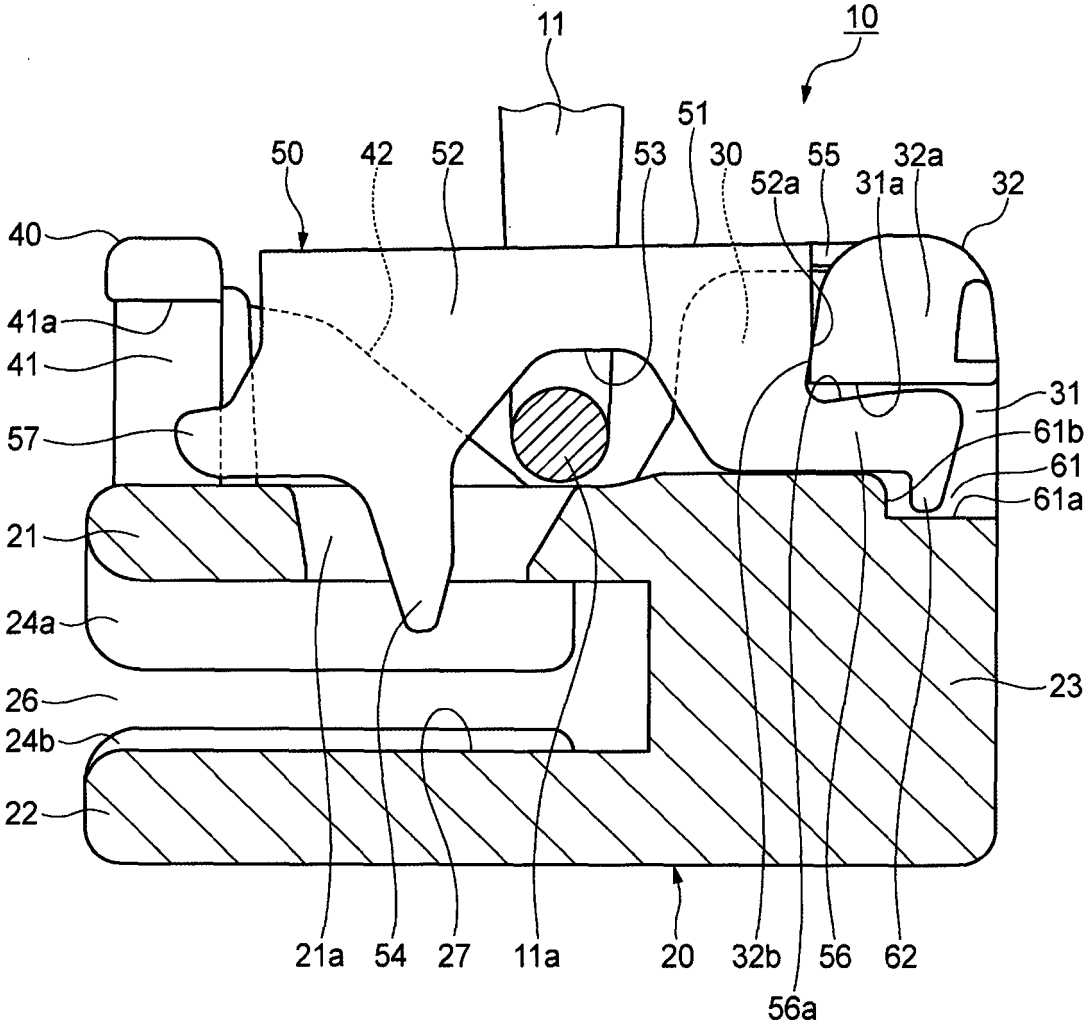
25
24b
33c
22
25
32b
31
61
23

FIG.9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11a
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32b
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62
56a

FIG.10

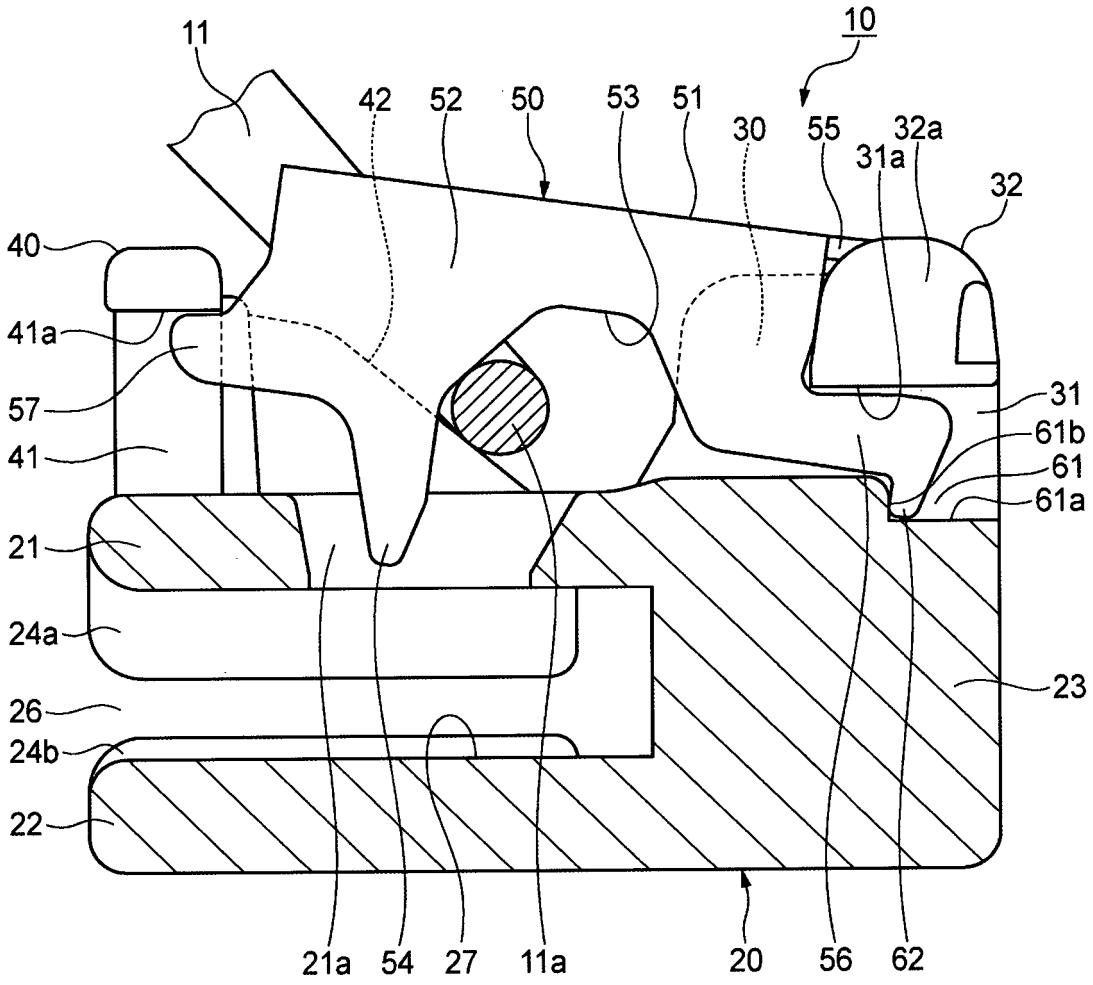
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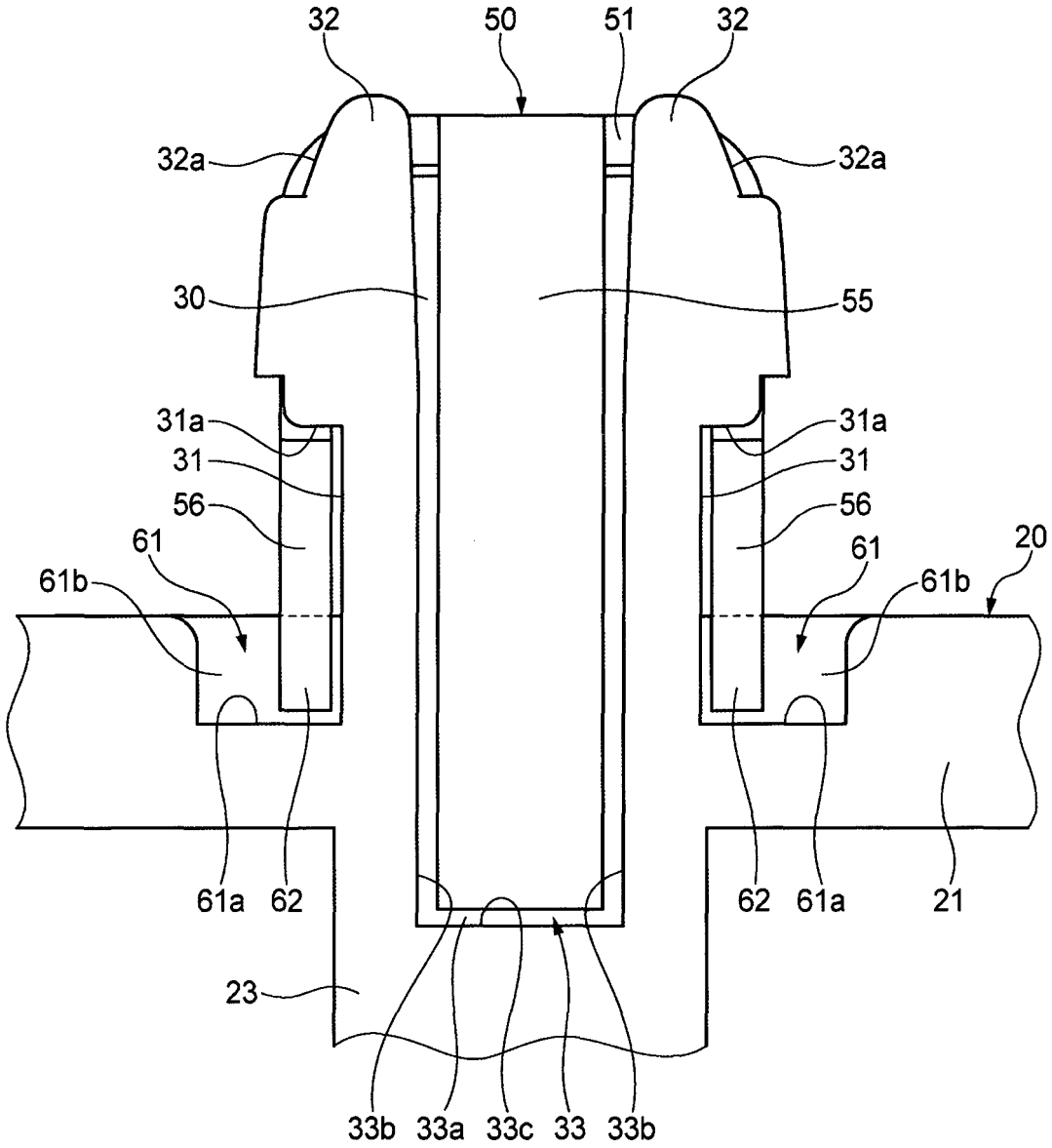
FIG.11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33c
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FIG.12

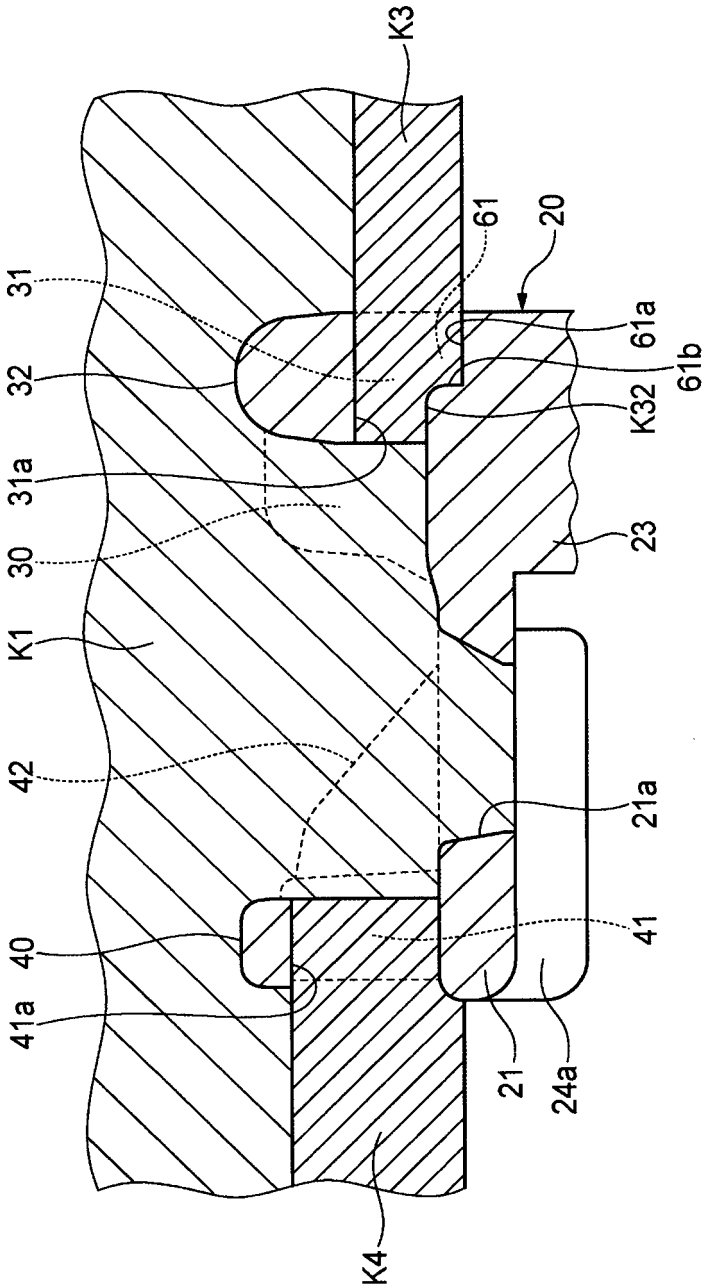

FIG.13

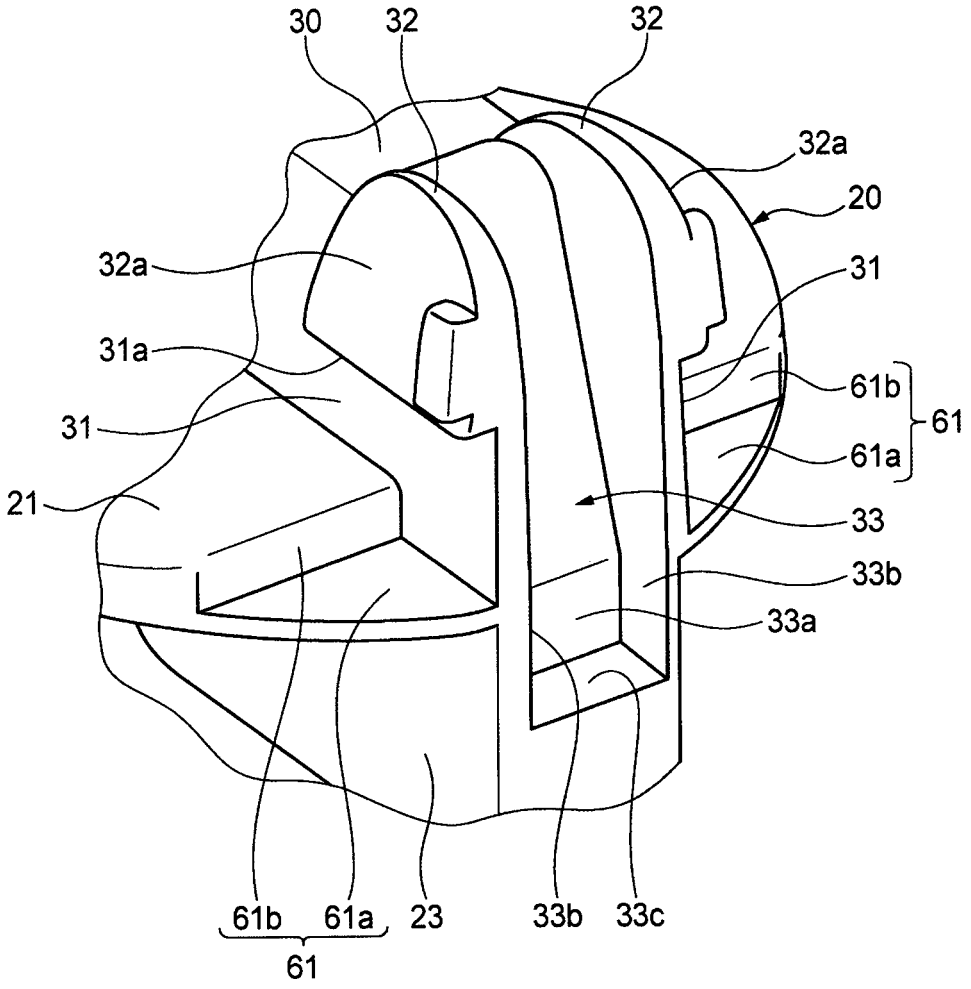
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FIG.14

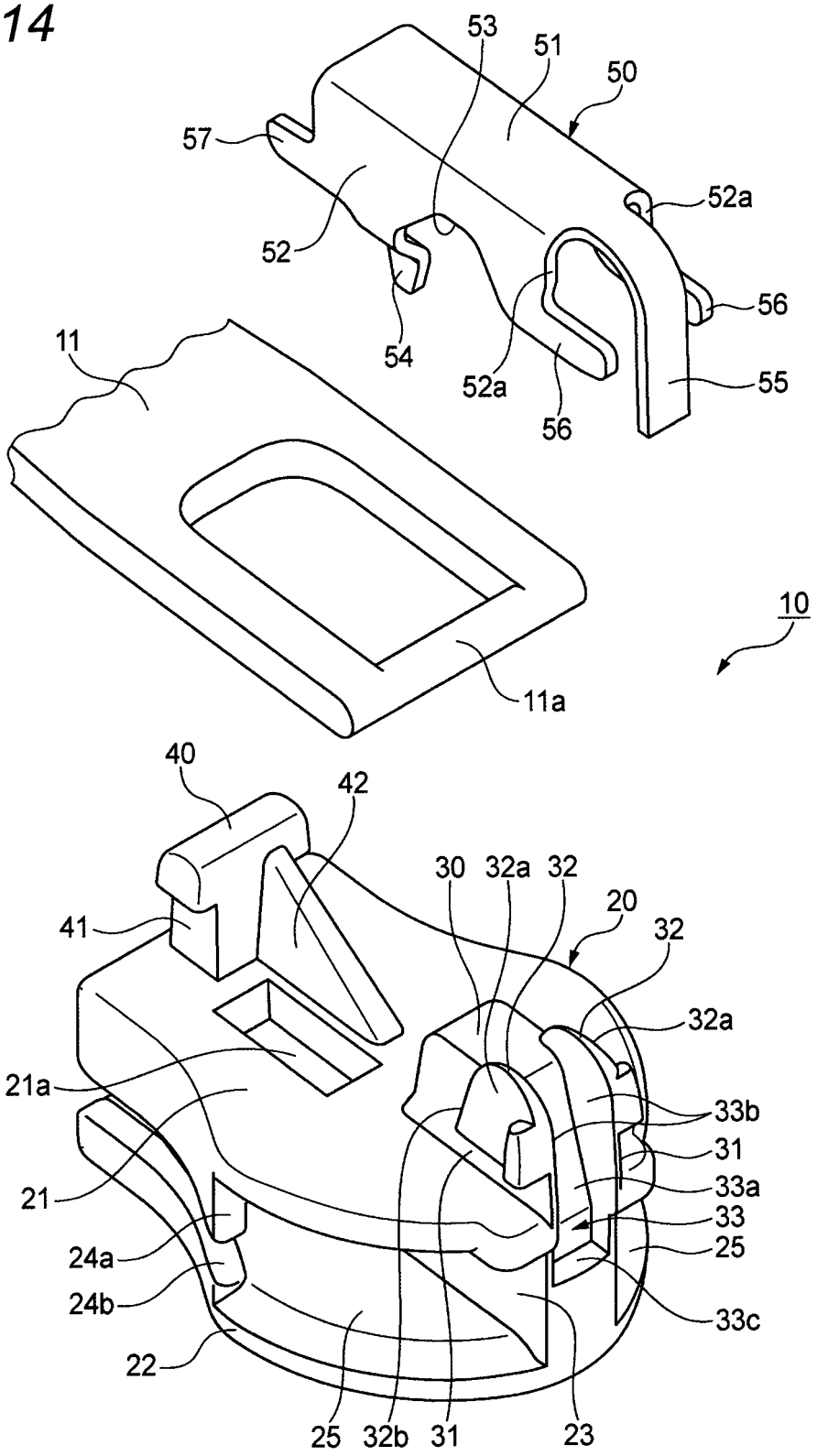
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FIG.15

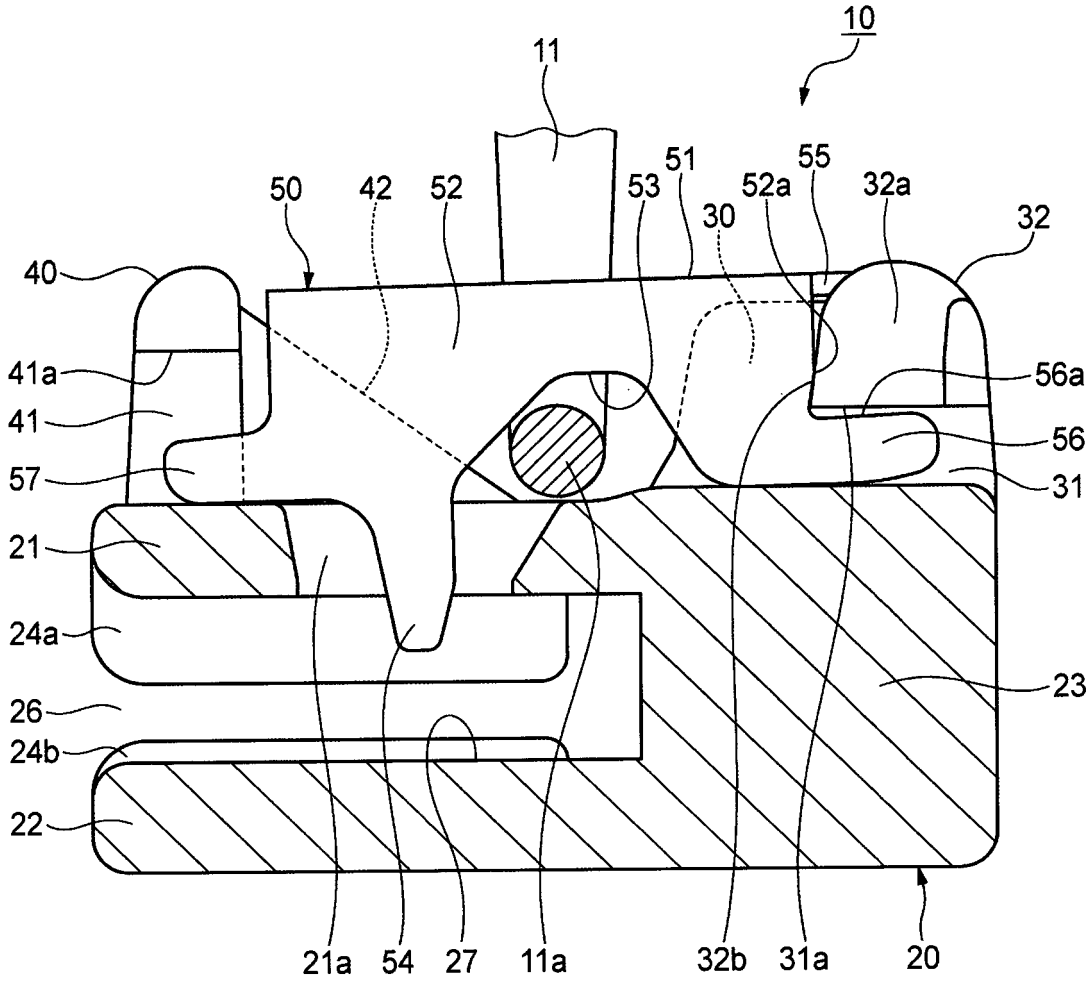
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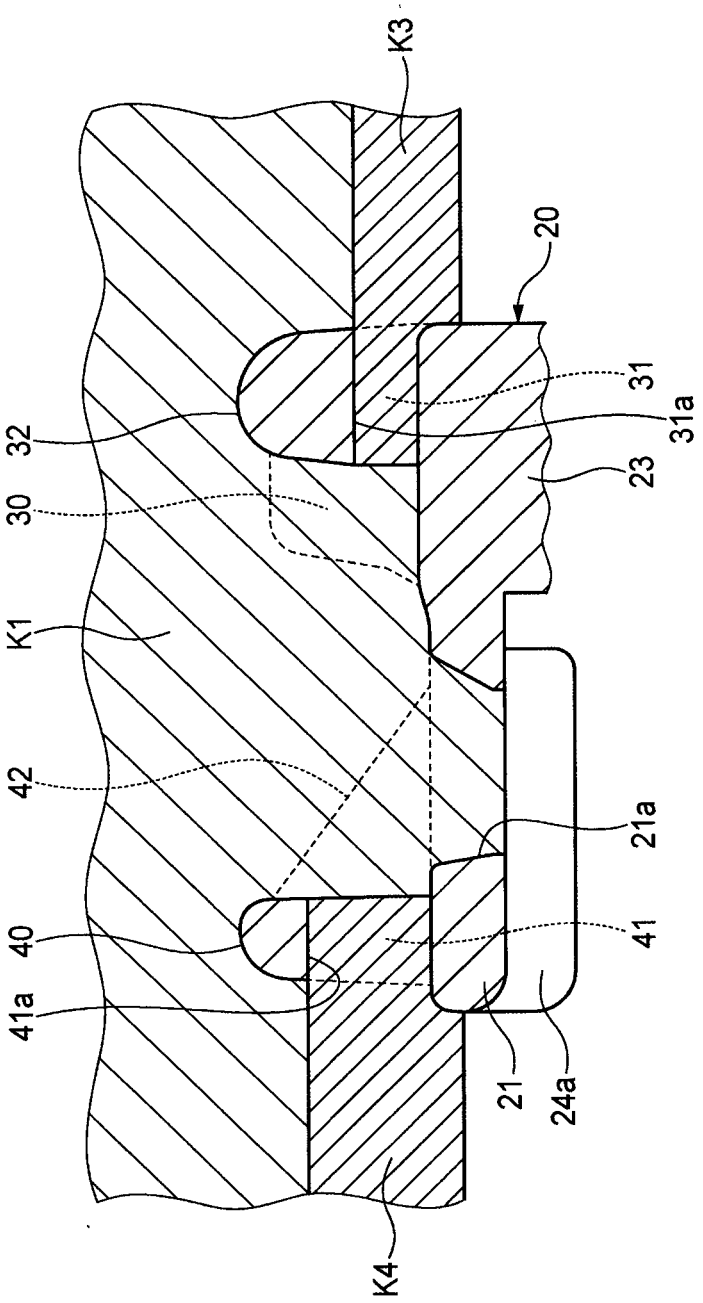
FIG.16



**INTERNATIONAL SEARCH REPORT**

International application No.
PCT/JP2011/069651

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 | 1996-2011 |
| Kokai Jitsuyo Shinan Koho | 1971-2011 | Toroku Jitsuyo Shinan Koho | 1994-2011 |

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | JP 2007-111351 A (YKK Corp.), 10 May 2007 (10.05.2007), paragraphs [0024] to [0046]; fig. 1 to 10 & EP 1776889 A1 & CN 1951250 A | 1-5 |
| Y | GB 644482 A (AERO ZIPP FASTENERS LTD.), 11 October 1950 (11.10.1950), page 3, line 68 to page 4, line 94; fig. 1 to 6 (Family: none) | 1-5 |

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

* Special categories of cited documents:
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 137914/1988(Laid-open No. 59610/1990) (Yoshida Kogyo Co., Ltd.), 01 May 1990 (01.05.1990), page 6, line 16 to page 12, line 7; fig. 1 to 4 & US 4980954 A & EP 365910 A1 & AU 4264789 A & BR 8905427 A & CA 2000172 A & KR 20-1991-0008299 Y & AU 612905 B & CA 2000172 A1 | 2-5 |
| A | US 3427692 A (Scovill Manufacturing Co.), 18 February 1969 (18.02.1969), entire text; all drawings & GB 1194664 A & DE 1902689 A & FR 2002155 A & BE 728585 A & CH 486222 A & NL 6902169 A & SE 363964 B & ES 146027 Y & DK 131416 B & BR 6906285 D | 1-5 |

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## REFERENCES CITED IN THE DESCRIPTION

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