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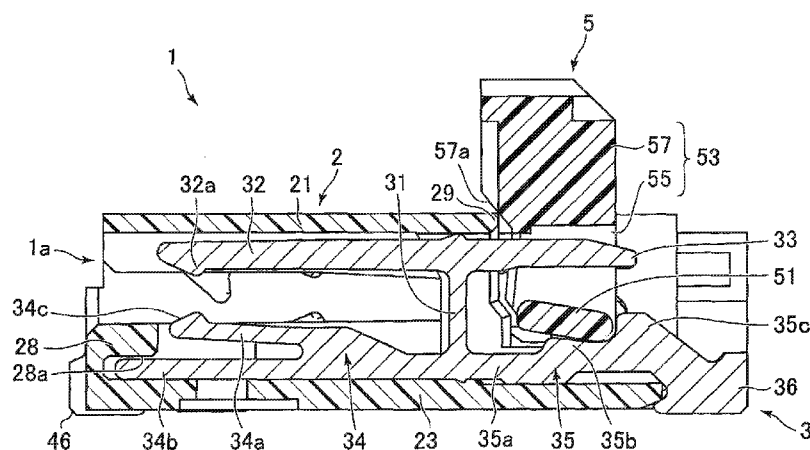


FIG. 2A

(57) Abstract: In a connector, a first stopper formed in a case is positioned above an upper front beam and to the front of a lever portion, and a second stopper formed in a lower rear beam of a first terminal is positioned to the rear of a cam portion. When the lever portion abuts the first stopper, the cam portion abuts the second stopper.

CONNECTOR

REFERENCE TO RELATED APPLICATIONS

[0001] The Present Application claims priority to prior-filed Japanese Patent Application No. 2010-18790, entitled "Connector," filed on 298 January 2010 with the Japanese Patent Office. The contents of the priority Patent Application is fully incorporated in its entirety herein.

BACKGROUND OF THE PRESENT APPLICATION

[0002] The Present Application relates, generally, to a connector and, more specifically, to a technology for keeping an actuator from coming out.

[0003] An actuator is disposed in connectors used on flat cables such as flexible printed circuits (FPC) and flexible flat cables (FFC) in order to maintain pressure contact between a terminal on the connector and an electrode in the flat cable. As an example, the connector terminal disclosed in Japanese Patent Application No. 2008-192408 (the contents of which is incorporated in its entirety herein) has a front beam extending in front of a base portion and a rear beam extending to the rear of the base portion. Here, the front beam and the rear beam are able to move up and down with respect to each other. A cam portion of an actuator is positioned below the rear beam, and is able to rotate between a pressed position in which the rear beam is pushed up and the front beam makes contact with the flat cable and a release position in which the pushing up is released. The actuator also has a lever portion extending in a direction away from the cam portion, and the cam portion rotates from the release position to the pressed position when the lever portion is flipped to the rear from the erect posture.

[0004] However, in the connector disclosed in the '408 Application, a rising portion is disposed to the rear of the cam portion as a stopper. However, even when a rising portion is formed, the cam portion may ride up over the rising portion and come off in the rear if a load is applied to the lever portion in the erect posture, and the load is towards the front and not towards the rear, as is usually the case.

SUMMARY OF THE PRESENT APPLICATION

[0005] In light of this situation, an object of the Present Application is to provide a connector that is able to keep an actuator from coming out. In order to solve this problem, the Present

Application comprises a connector having one or more terminals, a case for holding the terminals and an actuator. The terminals have a base portion, an upper front beam extending forward from an upper portion of the base portion and positioned above a flat cable, an upper rear beam extending rearward from the upper portion of the base portion and a lower rear beam extending rearward from a lower portion of the base portion. Here, the upper front beam and the upper rear beam are able to move up and down using the upper portion of the base portion as a pivot point. The actuator has a cam portion and a lever portion. The cam portion is positioned between the upper rear beam and the lower rear beam, and is able to rotate between a pressed position pushing open the clearance between the beams and a release position releasing the pushing action. The lever portion extends in a direction away from the center of rotation of the cam portion and is flipped to the rear from an erect posture when the cam portion rotates from the release position to the pressed position. A first stopper is formed in the case, and is positioned above the upper front beam and to the front of the lever portion. A second stopper is formed in the lower rear beam, and is positioned to the rear of the cam portion. Here, the cam portion abuts the second stopper when the lever portion abuts the first stopper.

[0006] In the Present Application, because the lever portion abuts the first stopper positioned in the front, the cam portion abuts the second stopper positioned to the rear even when a load is applied to the lever portion in the erect posture in the forward direction. This simultaneously keeps the lever portion from being flipped forward, and keeps the cam portion from rising up.

As a result, the actuator is kept from coming out.

[0007] Additionally, the lever portion can have a comb-shaped portion in which clearance has been formed for the upper rear beam to be inserted, and a manipulated portion separated from the cam portion by the comb-shaped portion. Also, the lever portion can abut the first stopper along the abutting face formed in the manipulated portion. This improves the abutting face area compared to situations in which the first stopper abuts the comb-shaped portion.

[0008] Further, the manipulated portion can jut forward from the comb-shaped portion when the lever portion has an erect posture. Because the first stopper abuts the manipulated portion jutting in front of the comb-shaped portion, the first stopper can be positioned farther to the front.

[0009] Also, the abutting face can be an inclined face inclining forward and downward when the lever portion has an erect posture. This allows the direction of the force acting on the lever portion from the first stopper to approximate the normal direction of the abutting face.

[0010] Additionally, the cam portion can pass between the upper rear beam and the second stopper, and be inserted between the upper rear beam and the lower rear beam. Further, the cam portion can be positioned above and in front of the second stopper between the upper rear beam and the lower rear beam, and the lower end portion of the inclined face can be positioned above the first stopper when the lever portion has a posture inclined forward from the erect posture. This allows the lever portion to be guided into an erect posture because the first stopper contacts the inclined surface when the cam portion has dropped downward.

BRIEF DESCRIPTION OF THE FIGURES

[0011] The organization and manner of the structure and operation of the Present Application, together with further objects and advantages thereof, may best be understood by reference to the following Detailed Description, taken in connection with the accompanying Figures, wherein like reference numerals identify like elements, and in which:

[0012] Figure 1A illustrates a perspective view of the connector of the Present Application;

[0013] Figure 1B illustrates a front view of the connector of Fig. 1A;

[0014] Figure 1C illustrates a top view of the connector of Fig. 1A;

[0015] Figure 2A illustrates a cross-sectional view of the connector of Fig. 1A;

[0016] Figure 2B illustrates another cross-sectional view of the connector of Fig. 1A;

[0017] Figure 3 illustrates another cross-sectional view of the connector of Fig. 1A;

[0018] Figure 4A illustrates another cross-sectional view of the connector of Fig. 1A;

[0019] Figure 4B illustrates another cross-sectional view of the connector of Fig. 1A;

[0020] Figure 5A is a diagram used to explain the assembly process for the connector of Fig. 1A;

[0021] Figure 5B is another diagram used to explain the assembly process of Fig. 5A;

[0022] Figure 5C is another diagram used to explain the assembly process of Fig. 5A;

[0023] Figure 5D is another diagram used to explain the assembly process of Fig. 5A;

[0024] Figure 6A is another diagram used to explain the assembly process of Fig. 5A; and

[0025] Figure 6B is another diagram used to explain the assembly process of Fig. 5A.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0026] While the Present Application may be susceptible to embodiment in different forms, there is shown in the Figures, and will be described herein in detail, specific embodiments, with

the understanding that the disclosure is to be considered an exemplification of the principles of the Present Application, and is not intended to limit the Present Application to that as illustrated.

[0027] In the embodiments illustrated in the Figures, representations of directions such as up, down, left, right, front and rear, used for explaining the structure and movement of the various elements of the Present Application, are not absolute, but relative. These representations are appropriate when the elements are in the position shown in the Figures. If the description of the position of the elements changes, however, these representations are to be changed accordingly.

[0028] The following is an explanation of the connector in an embodiment of the Present Application with reference to the drawings. Generally speaking, Figs. 1A-1C are a perspective view, front view and top view of the connector 1 in an embodiment of the Present Application. Figs. 2A-4B are cross-sectional views of the connector 1. Figs. 2A and 3 show the cam portion 51 in the release position, and Fig. 2B shows the cam portion 51 in the pressed position. Figs. 5A-16B are diagrams used to explain the assembly process for the same connector 1.

[0029] As shown in Figs. 1A-1C, the connector 1 has a substantially flat box-shaped case 2 molded from a material with insulating properties. An insertion opening 1a is located in the front face of the case 2, and the end portion of a flat cable (shown in the drawings) is inserted. The flat cable can be an FPC or FFC. In this embodiment, a group of electrodes is formed on both faces of the end portion. Inside the case 2, a first terminal 3 and a second terminal 4 formed by punching a thin plate with conductive properties are arranged parallel to each other at a predetermined interval. A long actuator 5 extending to the left and right, made from a material with insulating properties, is mounted on the upper right side of the case 2. A bracket 6 formed by bending a thin metal plate is mounted on both the left and right end portions of the case 2.

[0030] The case 2 has a substantially flat top portion 21 and bottom portion 23 facing each other vertically, and side portions 25 connecting the left and right end portions of the top and bottom portions. The space formed between the top portion 21 and the bottom portion 23 houses the first terminal 3 and the second terminal 4. Both the top portion 21 and the bottom portion 23 contain a plurality of grooves extending to the front and rear for the insertion of the first terminal 3 and the second terminal 4. The top portion 21 covers the entire area except for the rear portion of the bottom portion 23. The rear end portion of the top portion 21 is an edge portion extending to the left and right, and functions as the first stopper 29 described below.

[0031] As shown in Figs. 2A and 2B, the first terminal 3 is formed substantially in the shape of the letter H. In other words, the first terminal 3 has a bottom portion 31 extending in the vertical direction, an upper front beam 32 extending to the front of an upper portion of the base portion 31, an upper rear beam 33 extending to the rear of the upper portion of the base portion 31, a lower front beam 34 extending in front of a lower portion of the base portion 31 and a lower rear beam 35 extending to the rear of the lower portion of the base portion 31.

[0032] The base portion 31 is positioned in the central portion of the case 2 in the longitudinal direction, and the upper front beam 32 extends from the upper portion of the base portion 31 towards the insertion port 1a along the bottom face of the top portion 21 of the case 2. The upper front beam 32 is positioned above the flat cable 99 inserted into the case 2 from the insertion port 1a. A contact portion 32a protruding downward is formed at the front end of the upper front beam 32, and comes into contact with a terminal disposed in upper face of a flat cable 99. The upper rear beam 33 extends to the rear of the upper portion of the base portion 31 beyond the rear end portion of the top portion 31. The upper rear beam 33 is positioned above the cam portion 51 of the actuator 5, and is inserted into a space in the comb-shaped portion 55.

[0033] The lower front beam 34 extends from the lower portion of the base portion 31 towards the insertion opening 1a along the upper face of the bottom portion 23 of the case 2. The lower front beam 34 is positioned below the flat cable 99 inserted into the case 2 from the insertion port 1a. The lower front beam 34 splits into two midway and extends forward. The upper limb portion 34a positioned on the upper side is elastically deformable in the vertical direction. A contact portion 34c protruding upward is formed in the front end portion of the upper limb portion 34a, and the contact portion 34c comes into contact with a terminal disposed on the bottom surface of the flat cable 99. The lower limb portion 34b positioned on the lower end is supported by a support portion 28 jutting upward from the bottom portion 23 of the case 2. An insertion port 28a opening downward is formed in the support portion 28, and the front end portion of the lower limb portion 34b is inserted into the insertion port 28a.

[0034] The lower rear beam 35 extends in step-like fashion to the rear from the lower portion of the base portion 31, and to the rear beyond the rear end portion of the bottom portion 23. The lower rear beam 35 has a proximal portion 35a positioned on the proximal end, an abutting portion 35b positioned on a rising incline to the rear of the proximal portion 35a and a second stopper 35c positioned on a rising incline to the rear of the abutting portion 35b. The abutting

portion 35b is positioned below the cam portion 51 of the actuator 5 and abuts the cam portion 51. The second stopper 35c is positioned below the front end portion of the upper rear beam 33, and protrudes downward from the abutting portion 35b. The second stopper 35c is positioned to the rear of the cam portion 51 of the actuator 5. A contact portion 36 is positioned in the rear end portion of the lower rear beam 35 to the rear of the rear end portion of the bottom portion 23, juts out slightly below the bottom surface of the bottom portion 23, and comes into contact with a terminal disposed on the surface of a circuit board mounted by the connector 1.

[0035] As shown in Fig. 3, the second terminal 4 is formed substantially in the shape of the letter H. In other words, the second terminal 4 has a bottom portion 41 extending in the vertical direction, an upper front beam 42 extending to the front of an upper portion of the base portion 41, an upper rear beam 43 extending to the rear of the upper portion of the base portion 41, a lower front beam 44 extending in front of a lower portion of the base portion 41 and a lower rear beam 45 extending to the rear of the lower portion of the base portion 41.

[0036] The base portion 41 is positioned in the central portion of the case 2 in the longitudinal direction, and the upper front beam 42 extends from the upper portion of the base portion 41 towards the insertion port 1a along the bottom face of the top portion 21 of the case 2. The upper front beam 42 is positioned above the flat cable 99 inserted into the case 2 from the insertion port 1a. A contact portion 42a protruding downward is formed at the front end of the upper front beam 42, and the contact portion 42a comes into contact with a terminal disposed in upper face of a flat cable 99. The contact portion 42a formed in the middle portion of the upper front beam 42 and the contact portion 32a formed in the front end portion of the upper front beam 32 of the first terminal 3 are separated from each other longitudinally and are arranged in a zigzag pattern. The upper rear beam 43 extends to the rear of the upper portion of the base portion 41 beyond the rear end portion of the top portion 31. The upper rear beam 43 is positioned above the cam portion 51 of the actuator 5, and is inserted into a space in the comb-shaped portion 55. The upper front beam 42 and the upper rear beam 43 are elastically deformable so as to move vertically with respect to each other using the upper portion of the base portion 41 as the pivot point.

[0037] The lower front beam 44 extends from the lower portion of the base portion 41 towards the insertion opening 1a along the upper face of the bottom portion 23 of the case 2. The lower front beam 44 is positioned below the flat cable 99 inserted into the case 2 from the insertion port

1a. The lower front beam 34 has an upper limb portion 44a extending to the rear beyond the rear portion. The upper limb portion 44a is elastically deformable in the vertical direction. A contact portion 44c protruding upward is formed in the front end portion of the upper limb portion 34a, and the contact portion 44c comes into contact with a terminal disposed on the bottom surface of the flat cable 99. The contact portion 42a formed in the middle portion of the upper front beam 44 and the contact portion 34a formed in the front end portion of the upper front beam 34 of the first terminal 3 are separated from each other longitudinally and are arranged in a zigzag pattern. A contact portion 46 is jutting somewhat below the lower face of the bottom portion 23 is disposed in the front end portion of the lower front beam 44 and is positioned to the front of the front end portion of the bottom portion 23. The contact portion 46 comes into contact with a terminal disposed on the surface of the circuit board mounted by the connector 1.

[0038] The lower rear beam 45 extends from the lower portion of the base portion 31 towards the rear end of the bottom portion 23 of the case 2 along the upper surface of the bottom portion 23. The lower rear beam 45 is positioned below the cam portion 51 of the actuator 5, and abuts the cam portion 51. A saw-tooth indented portion 45a protruding upward is formed in the proximal portion of the lower rear beam 45. The indented portion 45a bites into the lower face of a support portion 27 disposed inside the case 2. The support portion 27 is positioned in front of the cam portion 51 of the actuator 5 between the upper rear beam 43 and the lower rear beam 45.

[0039] The actuator 5 is formed substantially in the shape of a rectangular plate extending to the left and right. One of the long ends of the actuator 5 is a manipulated portion 57 rotated by the user using the fingertips. A comb-shaped portion 55 in which slit-like spaces are arranged to the left and right is disposed in the other long end of the actuator 5. The front end portion of the comb-shaped portion 55 is connected by the cam portion 51, which has a non-circular cross-sectional profile. The cam portion 51 is arranged between the upper rear beam 33 and lower rear beam 35 of the first terminal 3, or between the upper rear beam 43 and the lower rear beam 45 of the second terminal 4. The upper rear beam 33 of the first terminal 3 or the lower rear beam 43 of the second terminal 4 is inserted into a space in the comb-shaped portion 55. The comb-shaped portion 55 and the manipulated portion 57 extending in the direction away from the rotational center of the cam portion 51 function as a lever portion 53 for rotating the cam portion 51.

[0040] The cam portion 51 is disposed so that the long diametrical direction approximates the thickness direction of the actuator 5. The comb-shaped portion 55 has a thickness approximately equal to the long diametrical length of the cam portion 51. The manipulated portion 57 is thicker than the comb-shaped portion 55, and protrudes beyond the comb-shaped portion 55 in the thickness direction of the actuator 5. The jutting portion of the manipulated portion 57 has an abutting face 57 on the side near the comb-shaped portion 55 which is inclined towards the comb-shaped portion 55. As shown in Fig. 2A, when the actuator 5 has an erect posture, the manipulated portion 57 protrudes to the front beyond the comb-shaped portion 55, and the abutting face 57a faces both upward and downward.

[0041] When the user manipulates the manipulated portion 57 disposed in the front end side of the lever portion 53, the cam portion 52 is rotated between the release position shown in Figs. 2A and 3 and the pressed position shown in Fig. 2B. In the pressed position shown in Fig. 2B, the cam portion 51 has a posture in which the long diametrical direction is in the vertical direction, and the upper rear beam 33 of the first terminal 3 pushes upward. More specifically, the interval between the upper rear beam 33 and the abutting portion 35b of the lower rear beam 35 is narrower than the long diameter of the cam portion 51, and the rising cam portion 51 widens the interval. Because the lower rear beam 35 abuts the lower portion 23 positioned on the lower side to restrict displacement, the cam portion 51 displaces the upper rear beam 33.

[0042] When the upper rear beam 33 of the first terminal 3 is pushed upward by the cam portion 51 in this way, the upper front beam 32 of the first terminal 3 is pushed downward and comes into contact with the upper face of the flat cable 99 inserted into the case 2. At this time, the flat cable 99 is interposed between the upper front beam 32 and the lower front beam 34. In this way, the contact portions 32a, 34c of the first terminal 3 are forcibly brought into contact with an electrode disposed on both faces of the flat cable 99. The second terminal 4 is deformed by the cam portion 51 in the same way as the first terminal 3.

[0043] In the release position shown in Figs. 2A and 3, the cam portion 51 has a posture in which the long diametrical direction is in the longitudinal direction. The upper rear beam 33 of the first terminal 3 is separated from the upper rear beam 43 of the second terminal 4, and the action pushing them upward is released. When released, the upper front beam 32 of the first terminal 3 and the upper front beam 42 of the second terminal 4 return from the pushed down position, and separate from the upper face of the flat cable 99. When the flat cable 99 is

interposed between the upper front beam 32 and the lower front beam 34 of the first terminal 3, it is released from being interposed between the upper front beam 42 and the lower front beam 44 of the second terminal 4, and can be inserted into or pulled from the insertion port 1a.

[0044] When the cam portion 51 is in the release position shown in Figs. 2 and 3, the lever position 53 goes into the erect position in which the direction of extension from the cam portion 51 is along the vertical direction. When the lever portion 53 is flipped by the user to the rear from the erect posture, the cam portion 51 rotates from the release position and reaches the pressed position shown in Fig. 2B. In this way, the connector 1 forms a back flip connector.

[0045] When the lever portion 53 is in the erect posture as shown in Figs. 2A and 3, the first stopper 29 disposed on the rear end portion of the top portion 21 of the case 2 is positioned above the abutting face 57a of the lever portion 53. Thus, when a load is applied not to the rear, as usual, but to the front of the lever portion 53 in the erect posture, the abutting face 57a on the lever portion 53 abuts the first stopper 29. At this time, force acts on the lever portion 53 to rotate the lever portion around the point of contact between the abutting face 57a and the first stopper 29, and the cam portion 51 separates from the abutting portion 35a and tries to rise upward at an oblique angle to the rear. However, because a second stopper 35c is formed in the first terminal 3 to the rear of the cam portion 51, as shown in Fig. 2A, the cam portion 51 abuts the second stopper 35c. As a result, the cam portion 51 is kept from rising up. This keeps the actuator 5 from coming out. In order to keep the cam portion 51 from rising up, the second stopper 35c should protrude upward from the abutting portion 35a by a length at least equal to, but preferably greater than, the short diameter of the cam portion 51.

[0046] Also, because in this embodiment the abutting face 57a disposed on the manipulated portion 57 of the lever portion 53 extending left and right abuts the first stopper 29 at the rear end portion of the top portion 21 of the case 2 extending left and right, the abutting area can be increased. Also, because in this embodiment the first stopper 29 abuts the manipulated portion 57 jutting to the front of the comb-shaped portion 55 with the lever portion 53 in the erect posture, the lower end portion of the top portion 21 of the case 2 does not have to jut to the rear more than necessary. Also, because in this embodiment the abutting face 57a faces both upward and downward when the lever portion 53 is in the erect posture, the first stopper 29 hits the abutting surface 57a of the lever portion 53 trying to flip forward near the normal direction of the

abutting face 57a. As a result, the lever portion 53 is kept from become misaligned when coming into contact with the first stopper 29.

[0047] As shown in Figs. 4A-4B, the bracket 6 has an inner portion 61 and an outer portion 63 extending to the front and rear. The inner portion 61 and the outer portion 63 are connected by a connecting portion 65 disposed in the rear portion (see Fig. 1C). The inner portion 61 has a substantially U-shaped fixed portion 61a opening downward, and a beam portion 61b extending forward from the fixed portion 61a. The fixed portion 61a is arranged so that the open end faces downward inside a groove 25a formed in the inner rear portion of the side portion 25 of the case 2. The fixed portion 61a presses down on the shaft portion 59 of the actuator 5 from above. The shaft portion 59 serving as the center of rotation is disposed in a position to the outside of the cam portion 51 on the left and right. The beam portion 61b is supported from below by a support arm 25b extending to the front in cantilever form from the side portion 25 of the case 2. A hook portion 61c protruding downward is formed in the front end portion of the beam portion 61b. The hook portion 61c hooks ear portions (not shown) disposed on both sides of the end portion of the flat cable 99, and functions to keep the flat cable 99 from coming out.

[0048] The outer portion 63 has a fixed portion 63a extending downward from the front portion, and a fixed portion 63b extending downward from the central portion. The fixed portion 63a is inserted into a hole portion 25c formed in the outer front portion of the side portion 25 of the case 2 and extending vertically. It is inserted until it reaches the bottom end of the hole portion 25c. The rear side of the fixed portion 63a has a hook shape so as to bite into the side wall of the hole portion 25c. The fixed portion 63a is exposed to the outside leftward and rightward from the clearance 25e of the side portion 25 (see Fig. 1A). This clearance 25e is used to solder the surface of the circuit board. The other fixed portion 63b is inserted into a hole portion 25d formed in the outer central portion of the side portion 25 of the case 2 and extending vertically. The front side of the fixed portion 63b has a hook shape to bite into the side wall of the hole portion 25d.

[0049] Figs. 5A-6B are diagrams used to explain the assembly process for the connector 1. First, as shown in Fig. 5A, the second terminal 4 is inserted into the case 2 from the front (*i.e.*, from the insertion port 1a). Next, as shown in Fig. 5B, the first terminal 3 is inserted into the case 2 from the rear. Next, as shown in Fig. 5C, the actuator 5 is mounted from the rear. Afterwards, as shown in Fig. 5D, the bracket 6 is mounted in the side portion 25 of the case 2 from above.

The contact portion 36 of the first terminal 3, the contact portion 46 of the second terminal 4, and the fixed portion 63c of the bracket 63 in this connector 1 are soldered to the surface of the circuit board, and fixed to the circuit board.

[0050] As shown in Figs. 6A and 6B, when the actuator 5 is mounted in the case 2, the lever portion 53 of the actuator 5 assumes a posture in which it leans slightly forward from the erect posture so that the long diametrical direction of the cam portion 51 is in the longitudinal direction. When the long diametrical direction is in the longitudinal direction, the cam portion 51 is passed between the upper rear beam 33 of the first terminal 3 and the second stopper 35c, and inserted between the upper rear beam 33 and the abutting portion 35b. At this time, the lower end portion of the abutting face 57a of the lever portion 53 is positioned above the first stopper 29. In other words, the cam portion 51 is inserted between the upper rear beam 33 and the abutting portion 35b. When it is positioned above and to the front of the second stopper 35c, the lower end portion of the abutting face 57a is positioned directly above the first stopper 29. When the cam portion 51 is lowered and faces the abutting portion 35b, the first stopper 29 comes into contact with the abutting face 57a, and the lever portion 53 is guided into the erect posture.

[0051] While a preferred embodiment of the Present Application is shown and described, it is envisioned that those skilled in the art may devise various modifications without departing from the spirit and scope of the foregoing Description and the appended Claims.

CLAIMS**WHAT IS CLAIMED IS:**

- 5 1. A connector, comprising:
- at least one terminal, each terminal including a base portion, an upper front beam
 extending forward from an upper portion of the base portion and positioned above a flat cable, an
 upper rear beam extending rearward from the upper portion of the base portion, and a lower rear
 beam extending rearward from a lower portion of the base portion, the upper front beam and the
10 upper rear beam being able to move up and down using the upper portion of the base portion as a
 pivot point;
- a case, the case being adapted for holding the terminals; and
- an actuator, the actuator including a cam portion, positioned between the upper
 rear beam and the lower rear beam, being able to rotate between a pressed position pushing open
15 the clearance between the beams and a release position releasing the pushing action, and a lever
 portion, extending in a direction away from the center of rotation of the cam portion, being
 flipped to the rear from an erect posture when the cam portion rotates from the release position to
 the pressed position;
- wherein a first stopper formed in the case is positioned above the upper front
20 beam and to the front of the lever portion.
2. The connector of Claim 1, wherein a second stopper formed in the lower rear
 beam is positioned to the rear of the cam portion, the cam portion abutting the second stopper
 when the lever portion abuts the first stopper.
- 25 3. The connector of Claim 2, wherein the lever portion has a comb-shaped portion in
 which clearance has been formed for the upper rear beam to be inserted.

4. The connector of Claim 3, wherein a manipulated portion separated from the cam portion by the comb-shaped portion.

5. The connector of Claim 4, wherein the lever portion abuts the first stopper along the abutting face formed in the manipulated portion.

6. The connector of Claim 5, wherein the manipulated portion juts forward from the comb-shaped portion when the lever portion has an erect posture.

7. The connector of Claim 5, wherein the abutting face is an inclined face inclining forward and downward when the lever portion has an erect posture.

8. The connector of Claim 2, wherein the cam portion passes between the upper rear beam and the second stopper, and is inserted between the upper rear beam and the lower rear beam.

9. The connector of Claim 5, wherein the cam portion is positioned above and in front of the second stopper between the upper rear beam and the lower rear beam.

10. The connector of Claim 9, wherein the lower end portion of the inclined face is positioned above the first stopper when the lever portion has a posture inclined forward from the erect posture.

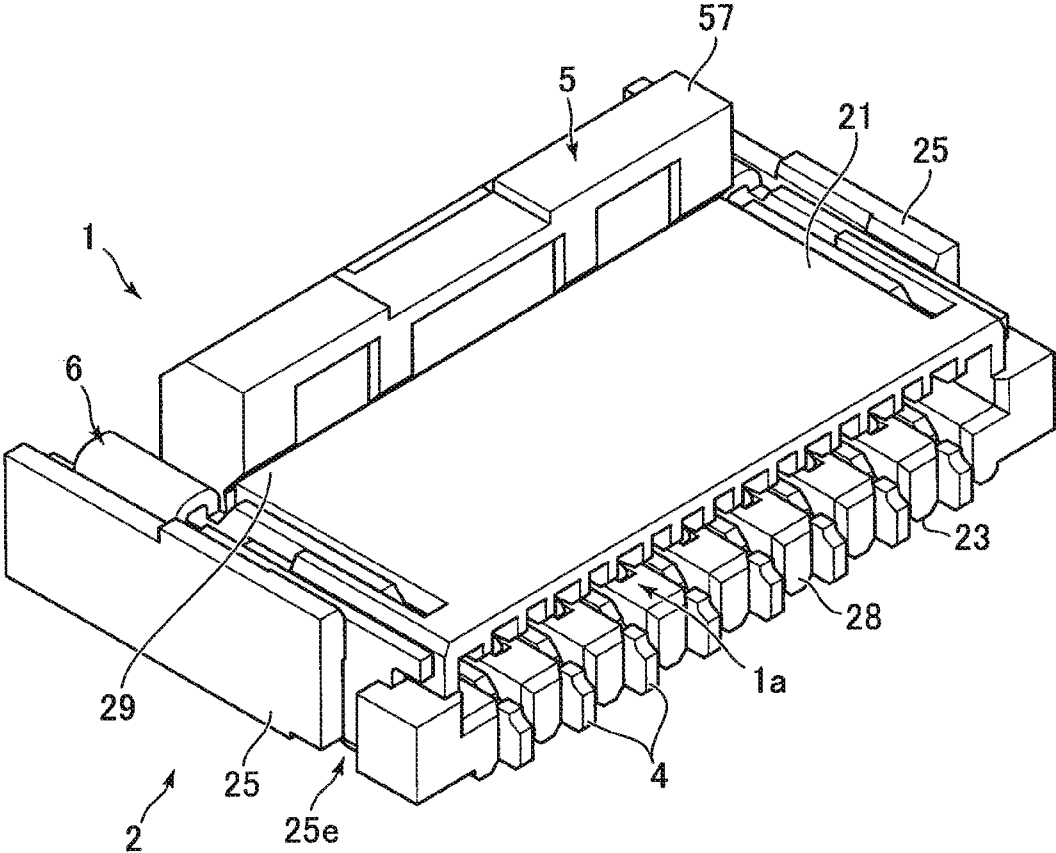


FIG. 1A

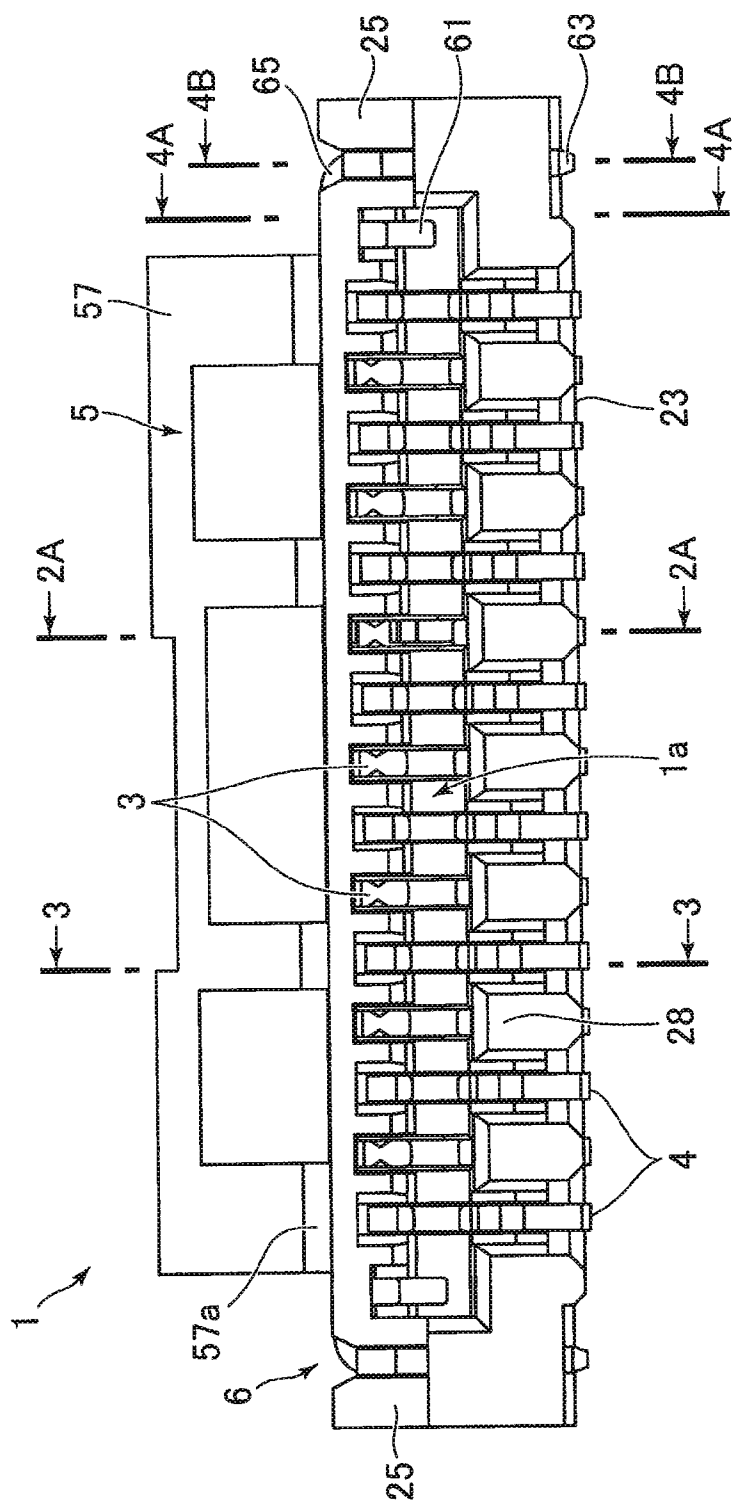


FIG. 1B

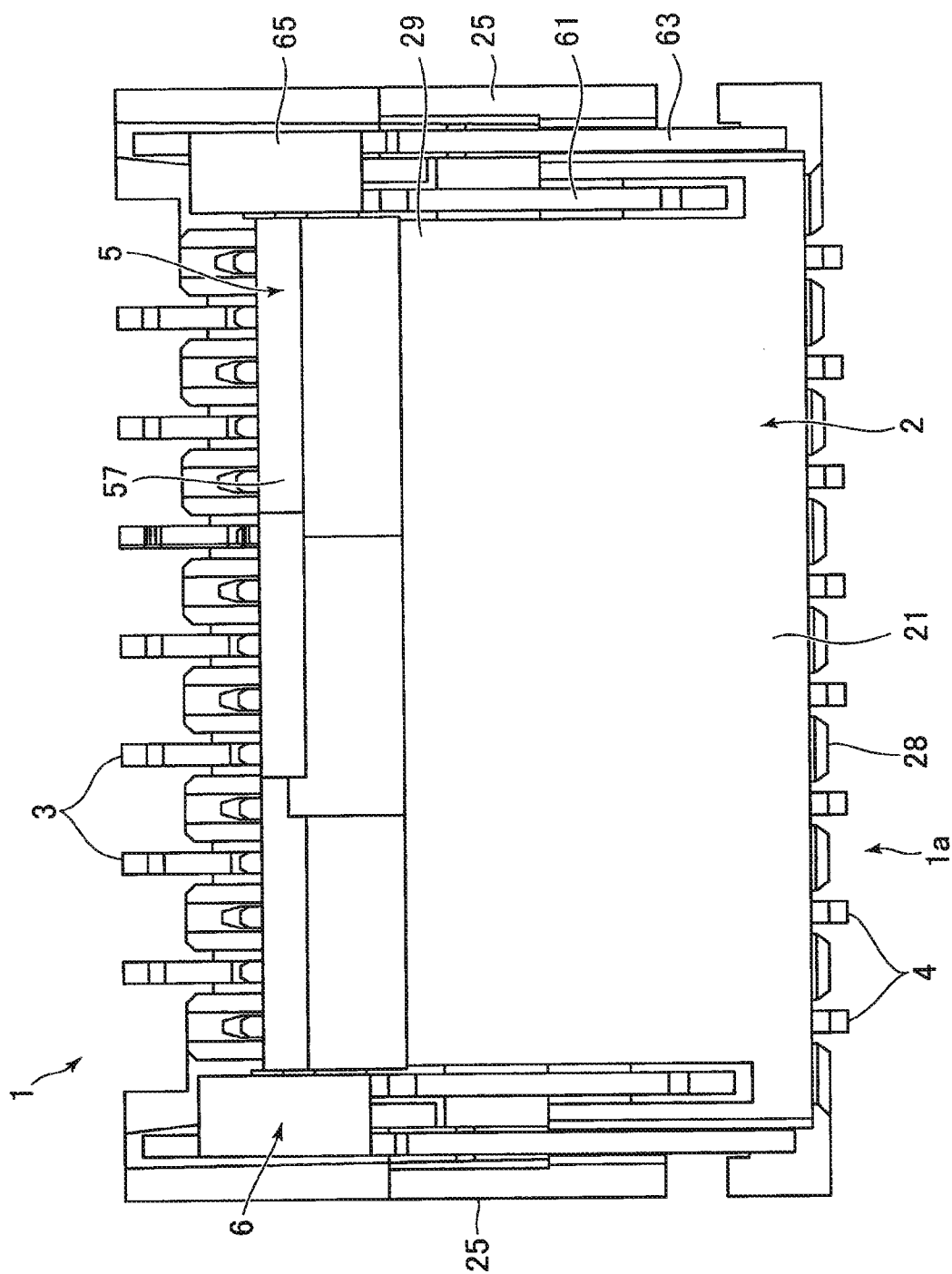


FIG. 1C

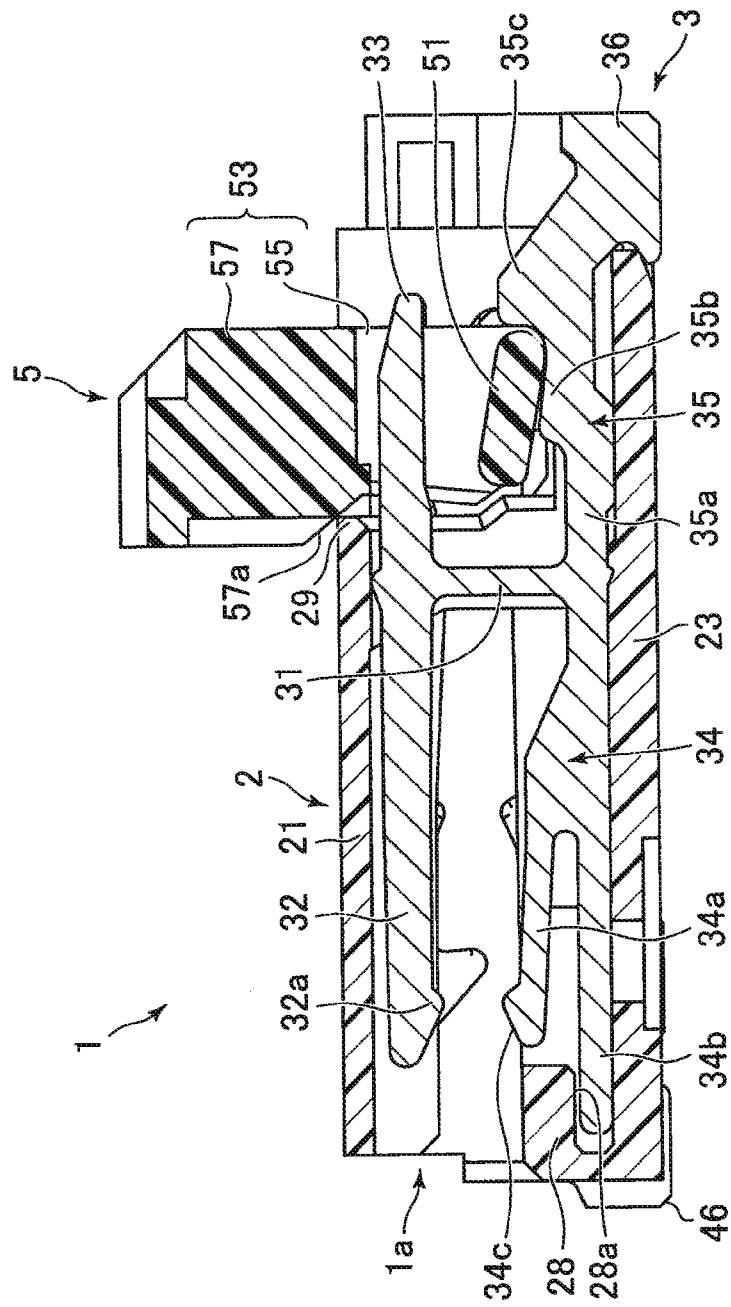


FIG. 2A

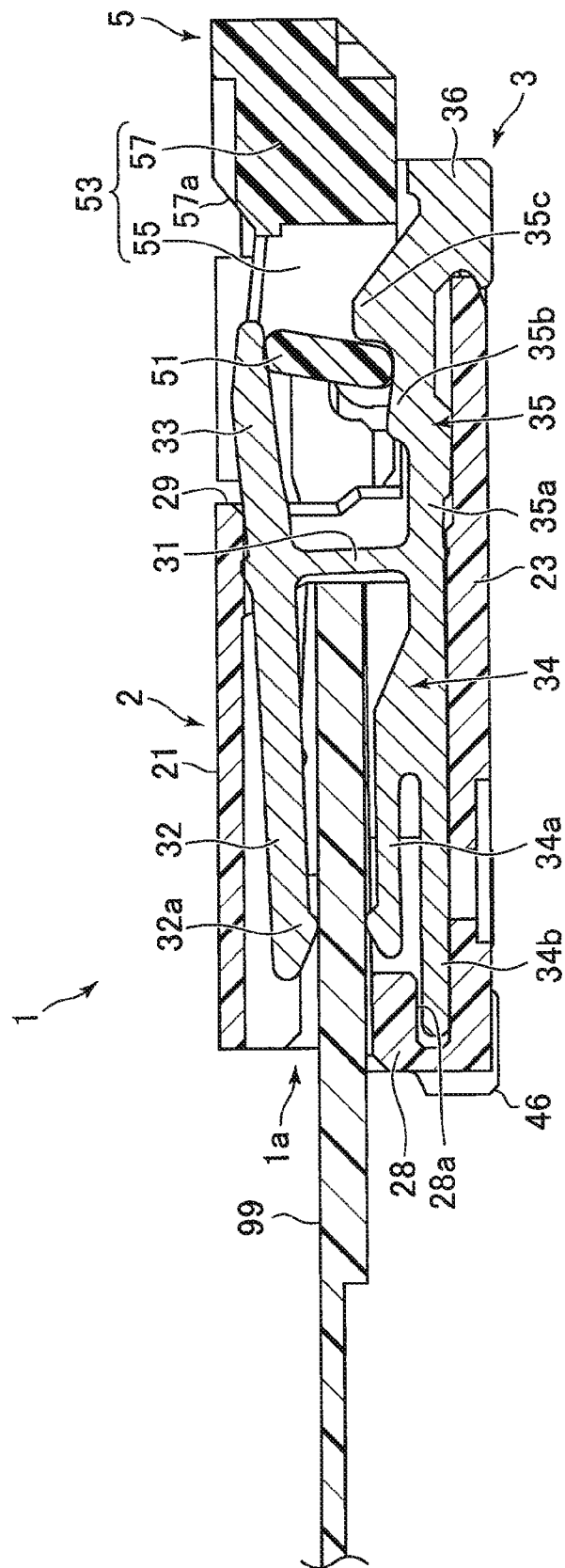


FIG. 2B

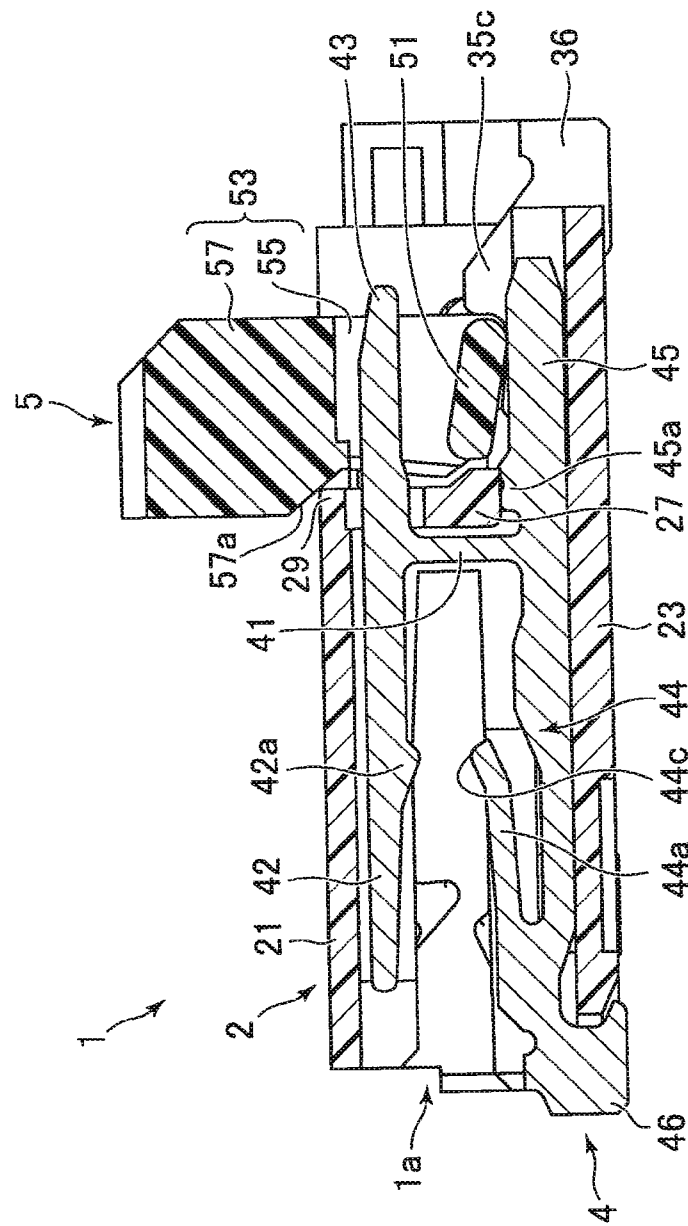


FIG. 3

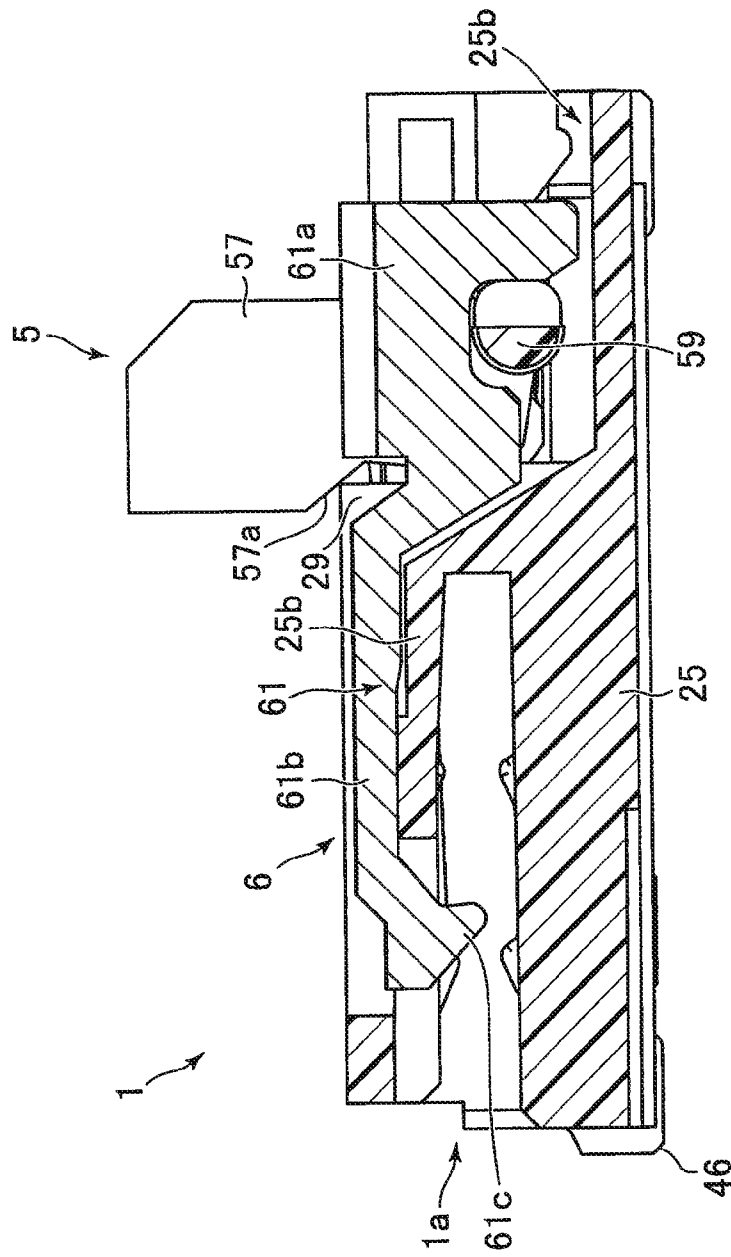


FIG. 4A

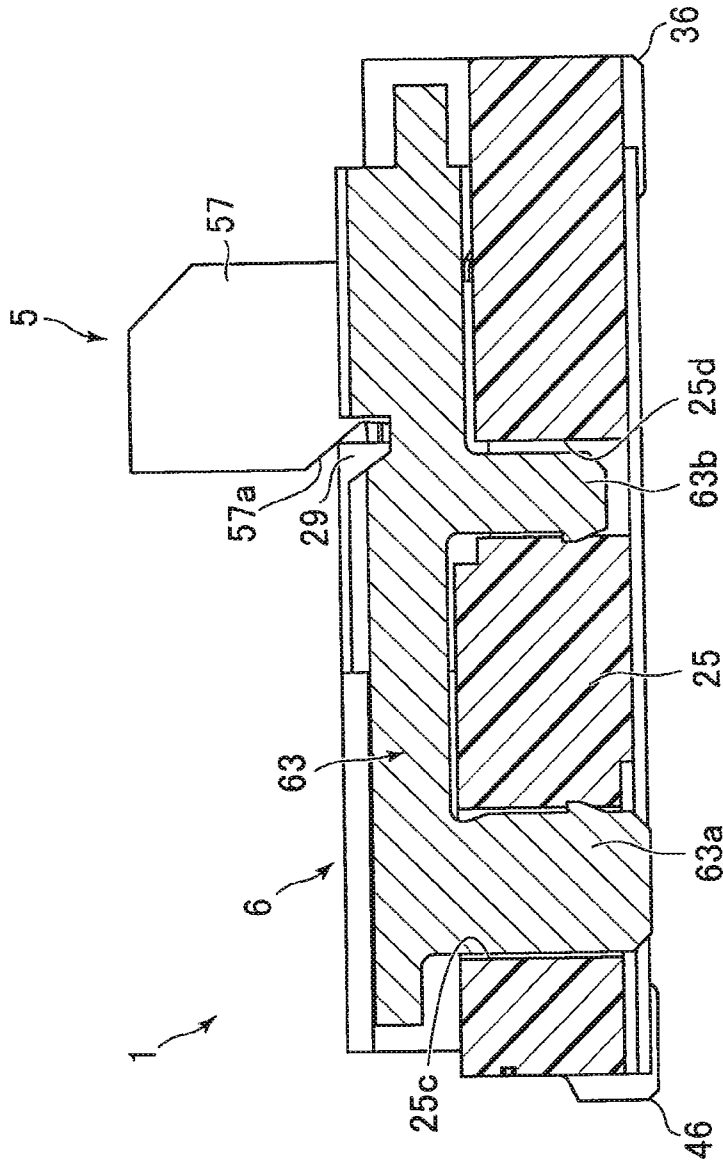


FIG. 4B

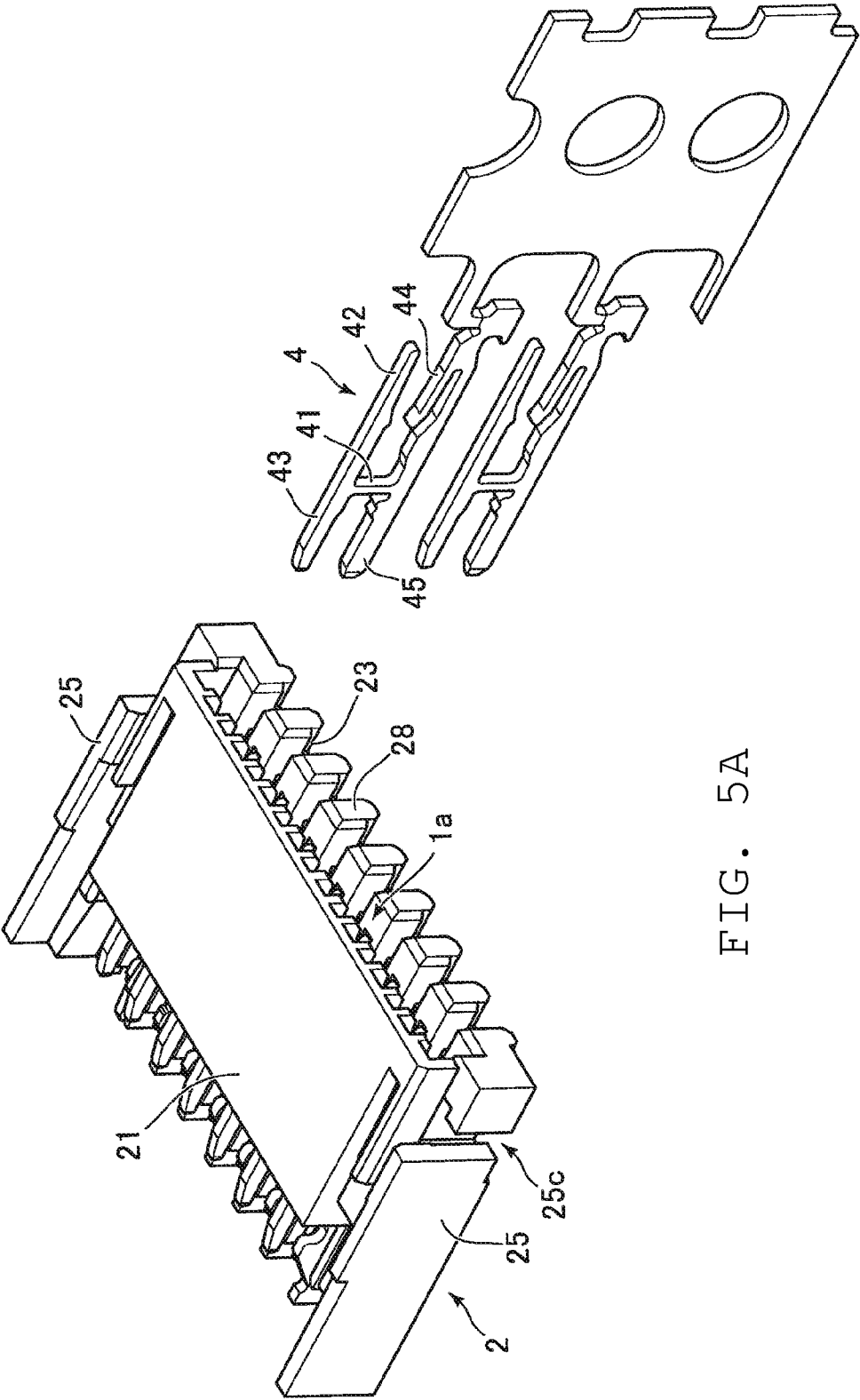


FIG. 5A

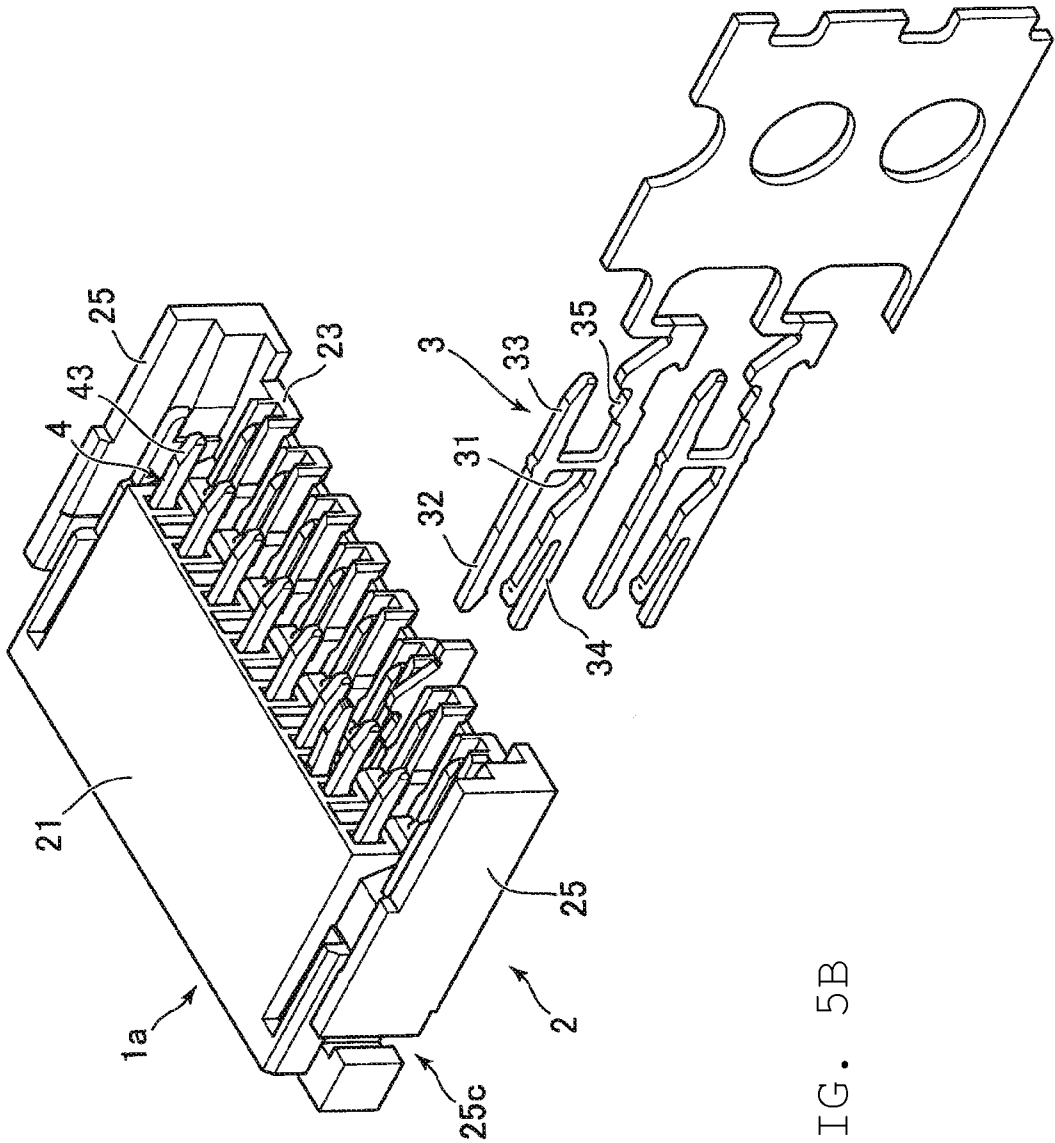


FIG. 5B

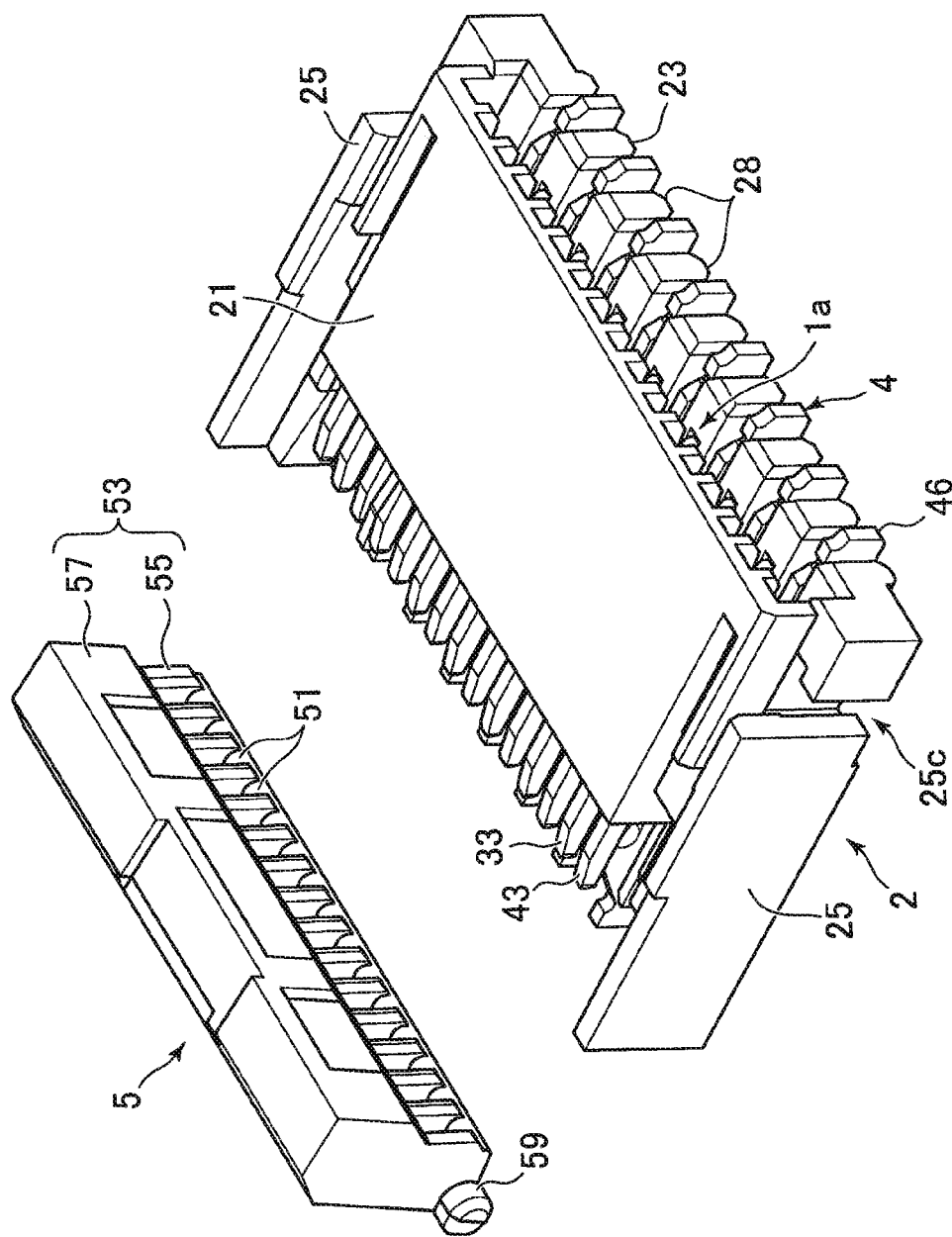


FIG. 5C

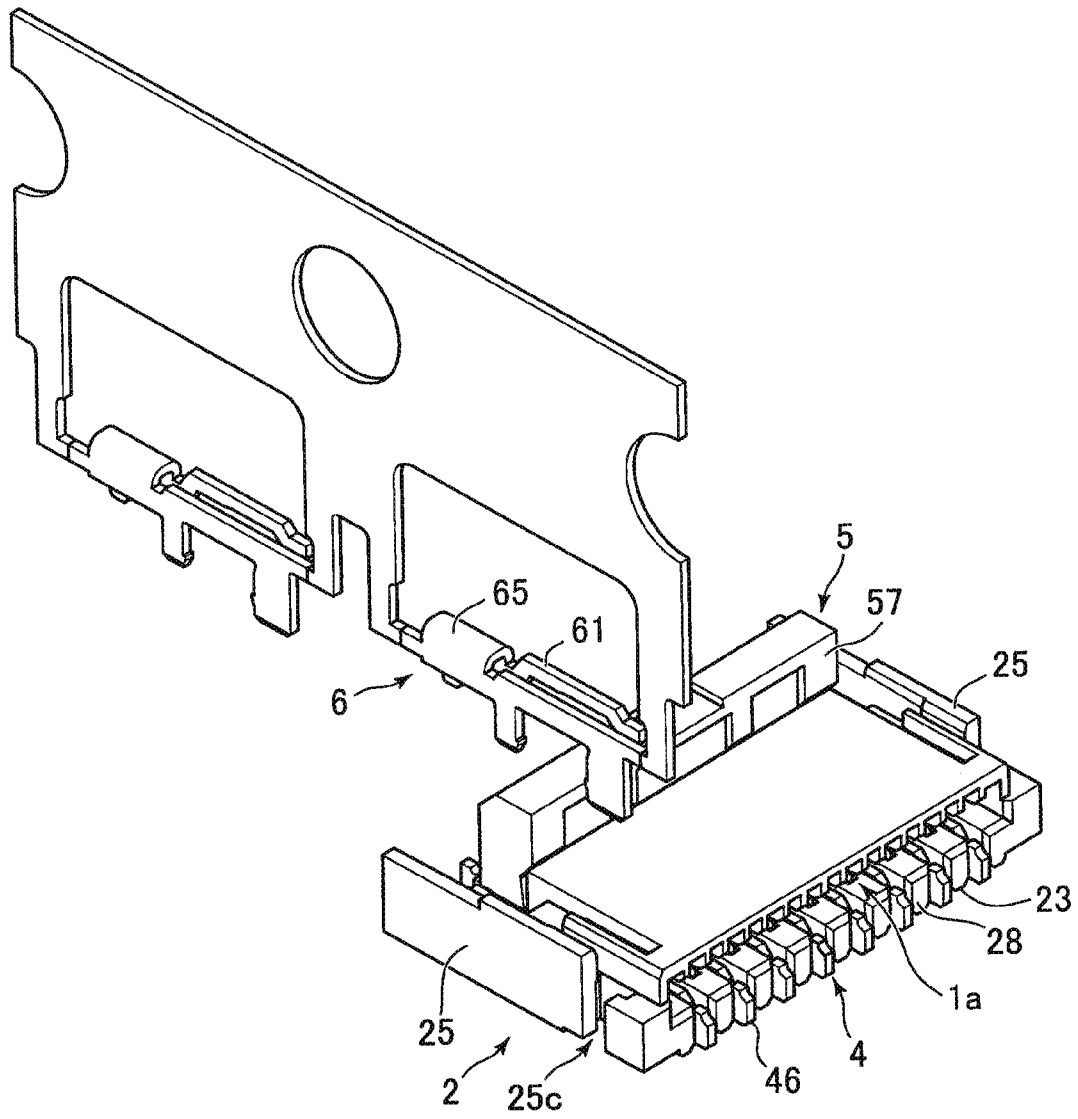


FIG. 5D

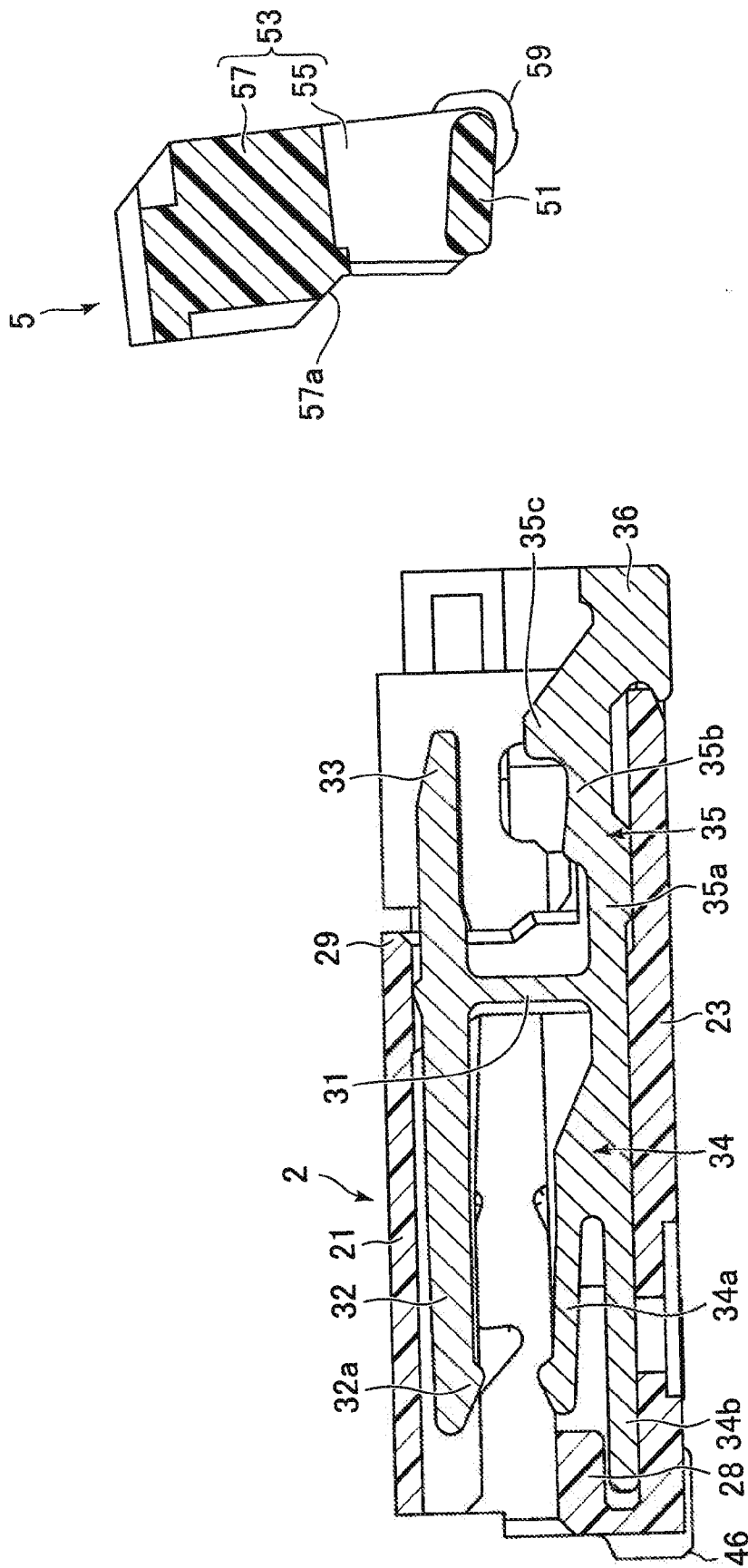


FIG. 6A.

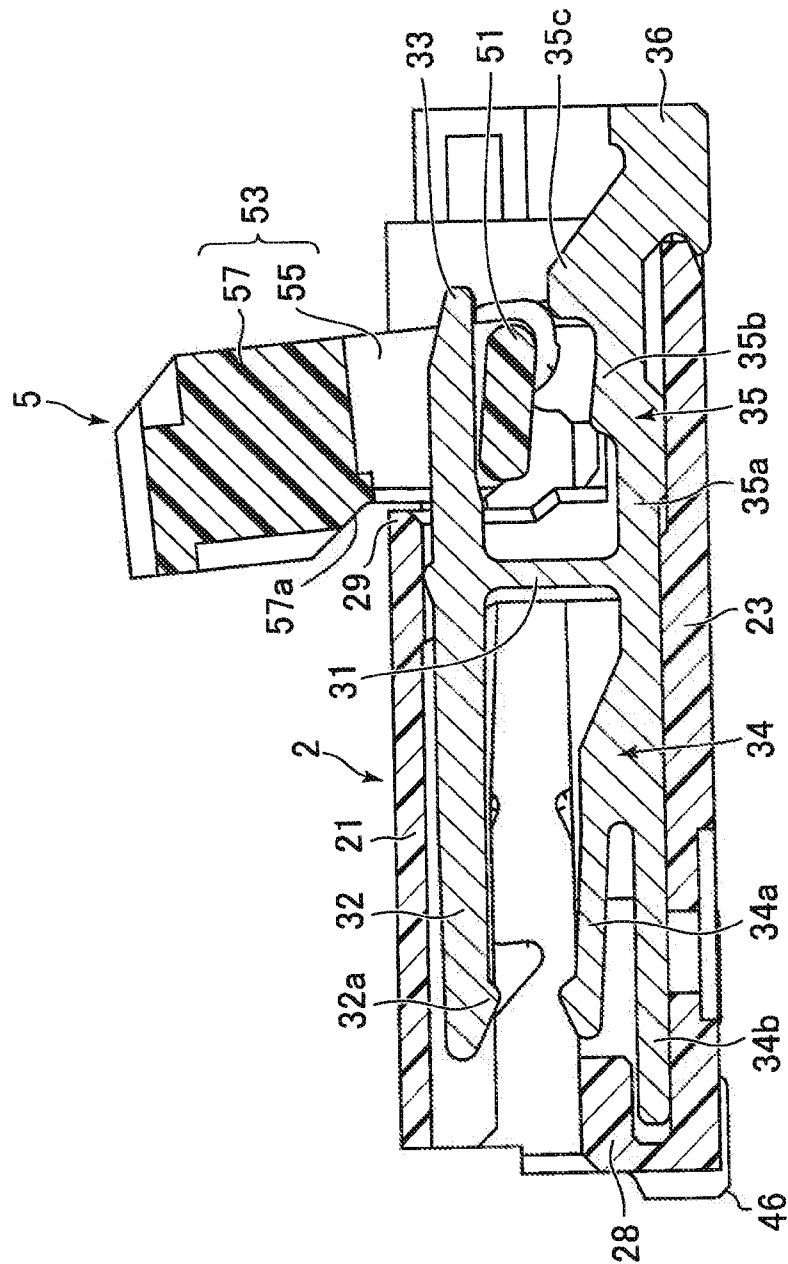


FIG. 6B