(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 489 931 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
22.08.2012 Bulletin 2012/34

(51) Int Cl.:
F21V 31/00 *(2006.01)* *F21Y 101/02* *(2006.01)*

(21) Application number: **12155567.6**

(22) Date of filing: **15.02.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **16.02.2011 JP 2011030835**

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(54) **Luminaire**

(57) According to one embodiment, a luminaire (1) includes a main body (11), a waterproof ring (25), a floodlight panel (28), an upper edge member (31), a light-emitting part (46), a waterproof member (61) and a side plate (71). The light-emitting part (46) provided in the main body (11) emits illumination light upward. The side plate (71) is coupled to the end of the main body (11) through the waterproof member (61). The waterproof member (61) and the side plate (71) include a first recess portion (62) and a second recess portion (76) continuous with the groove (38). Heights of bottoms (62a, 76a) of the respective recess portions (62, 76) are equal to or lower than the upper surface of the floodlight panel (28).

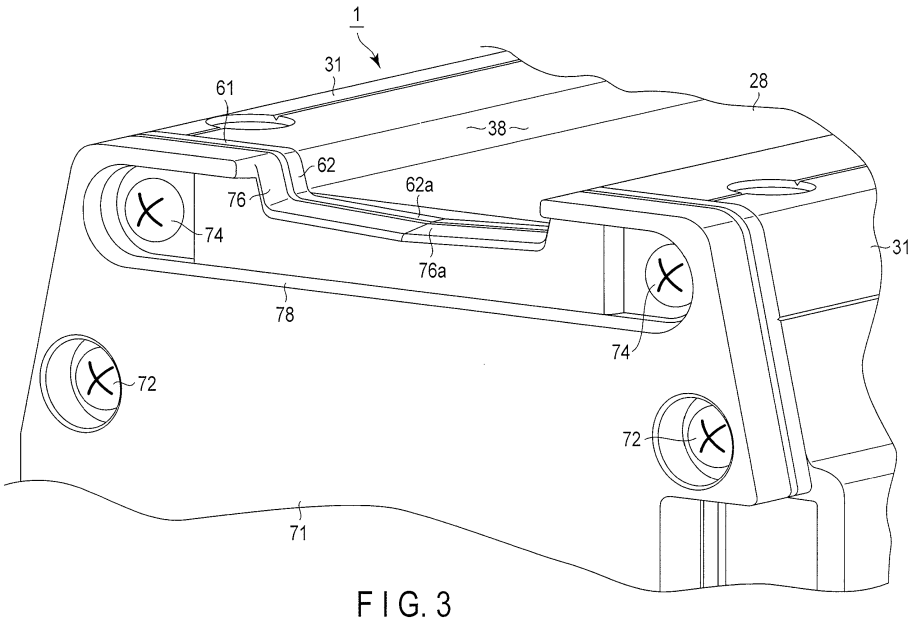

FIG. 3

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Description

FIELD

[0001] Embodiments described herein relate generally to a luminaire, such as a floodlight, which is installed outdoors and emits illumination light upward.

BACKGROUND

[0002] As related art, a floodlight is known in which a lamp is provided inside a substantially bullet-shaped reflecting plate and a support frame can be directed in an arbitrary direction. The support frame of the floodlight is ring-shaped, and is attached to the reflecting plate opening on a lighting side. The lighting side of the support frame is closed with a floodlight plate made of a glass plate or the like. The floodlight plate is attached to the support frame with a packing. The support frame is supported by both ends of a C-shaped attachment part.

[0003] In this floodlight, the whole outer periphery of the floodlight plate is continuously bordered by the support frame. Accordingly, the floodlight plate is indented from the support frame.

[0004] The floodlight installed outdoors is exposed to rainwater or the like. When the floodlight is used in a state where the floodlight plate is turned upward, the rainwater or the like falls into an indented portion formed of the floodlight plate and the support frame. This rainwater is dammed by the ring-shaped support frame and is not drained out.

[0005] If the packing is deteriorated and the waterproof performance is reduced, the rainwater collecting in the indented portion may permeate into the inside of the floodlight. Further, when the water collecting in the indented portion is dried, contaminations are concentrated and are sticked as dirt to the surface of the floodlight plate. The brightness of the floodlight may decrease by this dirt.

[0006] The disadvantage as stated above can be solved in such a way that the support frame and the floodlight plate are formed to be continuous with each other at the same height, that is, the floodlight plate is adhered to the support frame by using putty or caulking material. However, quite a long time is taken for most putty or caulking material to be sufficiently hardened and to certainly hold the floodlight plate. Thus, the production efficiency is reduced and the cost increases. Besides, putty or caulking material which is instantaneously hardened enough to hold the floodlight plate is usually not only high in material cost, but also requires a dedicated facility. Further, since handling of such putty or caulking material is troublesome, the production cost becomes high.

[0007] In the luminaire, such as the floodlight, in which the floodlight plate is turned upward and which is used outdoors, that the floodlight plate is fitted by the support frame without using putty or caulking material is preferable in reducing the manufacturing cost. However, when the floodlight plate is fastened by the support frame, consideration is required to prevent rainwater or the like from collecting on the floodlight plate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

FIG. 1 is a perspective view showing a luminaire of example 1.
FIG. 2 is an enlarged perspective view showing an end of the luminaire of FIG. 1.
FIG. 3 is an enlarged perspective view showing an upper part of the end shown in FIG. 2.
FIG. 4 is an exploded perspective view of the end shown in FIG. 2.
FIG. 5 is a perspective view showing a section of the upper part of the end shown in FIG. 2 taken along the longitudinal direction of the luminaire of FIG. 1.
FIG. 6 is a sectional view showing the upper part of the end shown in FIG. 2.
FIG. 7 is a perspective view in which a side plate and a waterproof member used as the end shown in FIG. 2 are separated.
FIG. 8 is a sectional view showing the luminaire of FIG. 1 in a direction perpendicular to the longitudinal direction.
FIG. 9 is a perspective view showing a part of the luminaire of FIG. 1, together with a separated upper edge member.
FIG. 10 is an exploded sectional view showing a panel fastening structure of the luminaire of FIG. 1.
FIG. 11 is a sectional view showing the panel fastening structure of FIG. 10 in a halfway assembled state.
FIG. 12 is a perspective view showing an end of a luminaire of example 2.
FIG. 13 is a sectional view showing an upper part of the end of FIG. 12.
FIG. 14 is a sectional view showing a panel fastening structure of a luminaire of example 3.

DETAILED DESCRIPTION

[0009] In general, according to one embodiment, a luminaire includes a main body, a waterproof ring, a floodlight panel, an upper edge member, a light-emitting part, a waterproof member and a side plate. In the luminaire, the light-emitting part to emit illumination light upward is incorporated in the main body. The main body includes opposed side walls in which seal grooves are formed in coupling upper end portions. The quadrangle ring-shaped waterproof ring is fitted in the seal grooves. The floodlight panel is settled over the coupling upper end portions, and is supported from below by the waterproof ring. The upper edge members are respectively coupled to the coupling upper end portions so as to press edge portions of the floodlight panel to the waterproof ring, and

a groove having an upper surface of the floodlight panel as a bottom is formed at an upper part of the main body. The waterproof member is placed to cover an end face of the main body, end faces of the upper edge members, and an end face of the floodlight panel. The side plate is coupled to the end of the main body through the waterproof member. The waterproof member and the side plate include a first recess portion and a second recess portion continuous with the groove. Heights of bottoms of the respective recess portions are equal to or lower than the upper surface of the floodlight panel.

[0010] In embodiment 1, the main body, the upper edge member, and the side plate are made of synthetic resin or metal, or compound material of these. When the main body is made of metal, the main body may be formed by press molding or the like, and is preferably formed of an extrusion molded member, especially an extrusion molded member of aluminum alloy in order to ensure reduction in weight, heat resistance and rustproof. In this case, the upper edge member is also preferably formed of an extrusion molded member of aluminum alloy.

[0011] In the embodiment 1, the floodlight panel is made of transparent or translucent resin, such as acryl resin, or glass. The "quadrangle" shape of the floodlight panel includes a rectangle (length in the longitudinal direction is arbitrary) or a square. In the embodiment 1, the "light-emitting part" emits light by supplied power, and for example, a light-emitting diode (LED) light-emitting part, such as an LED light-emitting package, including at least an LED chip as a light-emitting device can be preferably used. When plural light-emitting parts are provided, the arrangement of the light-emitting parts is arbitrary. For example, when the main body is long in one direction, the light-emitting parts are desirably arranged in the longitudinal direction at regular distances.

[0012] In the embodiment 1, the "end face of the main body" indicates the end face positioned in a direction in which the coupling upper end portion of the main body extends. The "end face of the upper edge member" indicates the end face positioned in a direction in which the upper edge member extends. The "end face of the floodlight panel" indicates the end face of another edge part except for the edge part pressed by the upper edge member among the four sides of the floodlight panel, that is, the end face of the edge part of the floodlight panel with which the section of the waterproof ring extending between the two coupling upper end portions to continuously connect the section of the waterproof ring fitted in the seal groove of the coupling upper end portion contacts from below.

[0013] In the embodiment 1, that "the heights of the bottoms of the first recess portion and the second recess portion are equal to or lower than the upper surface of the floodlight panel" includes the case where the heights of the bottoms are equal to the height of the upper surface of the floodlight panel. Preferably, the heights of the bottoms of the first recess portion and the second recess portion are lower than the upper surface of the floodlight panel so that even if manufacture tolerance or assembly tolerance is included, the tolerance does not become a factor to prevent drainage. Further, in the embodiment 1, the height of the bottom of the first recess portion may be equal to or different from the height of the bottom of the second recess portion. However, when the heights are different from each other, in order to facilitate draining off of water on the floodlight panel from the end of the upper groove of the main body to the outside, the height of the bottom of the second recess portion is made lower than the height of the bottom of the first recess portion.

[0014] In the embodiment 1, in order to press the parallel edge portions of the floodlight panel to the waterproof ring from above, the upper edge members are respectively coupled to the coupling upper end portions of the main body. As a result, the floodlight panel is fastened to the main body. The groove having the floodlight panel as the bottom is formed between the two upper edge members.

[0015] In general, there is a tendency that rainwater or the like collects in the groove. However, in the embodiment 1, the waterproof member and the side plate that are provided to waterproof and close the end face of the main body include the first recess portion and the second recess portion communicating with the groove. The bottoms of the recess portions are set to be equal to or lower than the upper surface of the floodlight panel. Accordingly, water poured into the groove will be drained off through the first recess portion and the second recess portion without being dammed by the waterproof member and the side plate.

[0016] In a luminaire of embodiment 2, in addition to the luminaire of embodiment 1, at least the bottom of the second recess portion is inclined in a drainage direction so that the bottom becomes lower than the upper surface of the floodlight panel.

[0017] In the embodiment 2, the bottom of the second recess portion is preferably inclined to become lower than the upper surface of the floodlight panel in the direction of moving away from the end face of the floodlight panel. Besides, the bottom of the second recess portion may be provided to gradually descend toward a portion so that the center portion of the second recess portion or at least one end in the direction crossing the groove becomes the lowest portion. Further, the bottom of the second recess portion may include the two inclinations compositely. When the bottom of the first recess portion is also inclined, the bottom may be inclined similarly to the bottom of the second recess portion.

[0018] In the embodiment 2, water which reaches the second recess portion through the first recess portion from the groove having the floodlight panel as the bottom is guided by the inclination of the bottom of the second recess portion, and is drained off to the outside more smoothly than the case of the embodiment 1. At this time, when the bottom of the second recess portion is inclined so that the center portion of the second recess portion

or at least one end in the direction crossing the groove becomes the lowest portion, since the water reaching the bottom of the second recess portion is collected to the lowest portion and is drained off, smooth drainage is further expedited.

[0019] In a luminaire of embodiment 3, in addition to the structure of the luminaire of the embodiment 1 or the embodiment 2, a ring support part to support a section of the waterproof ring extending between the side walls from below is provided in the waterproof member.

[0020] In the embodiment 3, the ring support part is preferably formed into a groove shape opening upward similarly to the seal groove. However, the ring support part may not have the groove shape as long as the ring support part can support the waterproof ring.

[0021] In the embodiment 3, the ring support part of the waterproof member supports the section of the waterproof ring between the side walls from below. The ring support part prevents the section between the side walls from hanging down by its own weight and from separating from the floodlight panel. Accordingly, the luminaire ensures the waterproof property of the waterproof ring.

[0022] In a luminaire of embodiment 4, in addition to the structure of the luminaire of the embodiment 3, a support protrusion that is inserted in the waterproof member and supports the ring support part from below is provided in the side plate.

[0023] In the embodiment 4, since the support protrusion of the side plate harder than the waterproof member supports the ring support part from below, when the upper edge member presses the floodlight panel, the section of the waterproof ring between the side walls and the ring support part are sandwiched between the support protrusion and the floodlight panel. The section of the waterproof ring between the side walls is strongly brought into close contact with the floodlight panel and the ring support part. Hence, the waterproof function of the waterproof ring becomes certain.

[0024] In a luminaire of embodiment 5, a screw hole into which a coupling screw for attaching the upper edge member to the coupling upper end portion is screwed is provided in the coupling upper end portion outside the seal groove in the width direction crossing the seal groove. One of the coupling upper end portion and the upper edge member includes a projection positioned at a side opposite to the seal groove with respect to the screw hole. The other of the coupling upper end portion and the upper edge member includes a contact surface in contact with the projection. A gap is provided between the coupling upper end portion and the upper edge member screwed to the coupling upper end portion except for the contact place between the projection and the contact surface.

[0025] In the embodiment 5, when the upper edge member is screwed to the coupling upper end portion, the projection and the contact surface contact each other because the coupling screw is tightened into the screw hole to a certain degree, and the upper edge member is supported from below by the coupling upper end portion. When the coupling screw is further tightened, the upper edge member is screwed to the coupling upper end portion while the contact place between the projection and the contact surface functions as a fulcrum, a portion where the head of the coupling screw contacts the upper edge member functions as the point of a lever where force is applied, and a portion where the upper edge member presses the floodlight panel functions as the point of application. At this time, the gap is provided between the upper edge member and the coupling upper end portion except for the contact place between the projection and the contact surface. The moment acting on the upper edge member because the coupling screw is tightened around the contact portion between the projection and the contact surface as the fulcrum, presses the floodlight panel to the main body from above. The waterproof function of the waterproof ring is ensured.

[Example 1]

[0026] Hereinafter, a luminaire of example 1 will be described in detail with reference to FIG. 1 to FIG. 11.

[0027] Reference numeral 1 in FIG. 1 to FIG. 3 and FIG. 8 denotes the luminaire supported by an equipment holder. The equipment holder and the luminaire 1 constitute an illumination apparatus. In FIG. 8, a bolt holder 2, a bolt 3, a washer 4 and a nut 5 constitute a coupling unit to couple the equipment holder and the luminaire 1. The bolt holder 2 is fitted to a head of the bolt 3 and is used to stop rotation of the bolt 3.

[0028] The luminaire 1, together with the equipment holder, is installed outdoors in order to emit light upward and to light up an irradiation target, for example, a wall of a building. The luminaire 1 includes a main body 11, a waterproof ring 25, a floodlight panel 28, two upper edge members 31, a light source unit 41, two waterproof members 61, two side plates 71, and so on.

[0029] As shown in FIG. 1, FIG. 4 and FIG. 9, the main body 11 is obtained by cutting a metal mold member, for example, an extrusion molded member of aluminum alloy to have a predetermine length, and is, for example, sufficiently longer than the width of the cut surface. As shown in FIG. 8, the main body 11 includes a pair of side walls 12 opposed to each other in a width direction (short direction) perpendicular to the longitudinal direction, and a bottom wall 13 continuously connecting lower ends thereof. The room between the side walls 12 is opened at both ends in the longitudinal direction and upward except the bottom wall 13.

[0030] As shown in FIG. 8, one of the side walls 12 includes a groove 14 in which the bolt holder 2 as the coupling unit is inserted. A groove wall 14a defining the groove 14 constitutes a portion of an outer surface of the one side wall 12. When the nut 5, together with the washer 4, is attached to the bolt 3 of the bolt holder 2 inserted in the groove 14 and is tightened, the groove wall 14a is clamped between the bolt holder 2 and the washer 4. As

a result, the coupling unit is fastened on a predetermined position of the one side wall 12 in the longitudinal direction.

[0031] As shown in FIG. 8, the opposed side walls 12 respectively include coupling upper end portions 16. The coupling upper end portions 16 are opposite to each other in the width direction of the main body 11 and are parallel to each other. As shown in FIG. 8, FIG. 10 and FIG. 11, the coupling upper end portion 16 is provided with a seal groove 17, screw holes 18 and a projection 19. The seal groove 17 and the projection 19 extend over the whole length of the coupling upper end portion 16 in the longitudinal direction. The plural screw holes 18 are provided in the longitudinal direction of the coupling upper end portion 16 at distances, and only one screw hole is shown in the drawing.

[0032] The seal groove 17 is opened upward, and the width thereof is defined by a pair of groove walls 17a and 17b directed upward. The shorter groove wall 17b is adjacent to the upper opening of the main body 11, and partitions the upper opening. The taller groove wall 17a is separated from the groove wall 17b by a distance corresponding to the groove width of the seal groove 17. The screw hole 18 is provided at a position shifted to the outside from the seal groove 17 of the coupling upper end portion 16 in the width direction crossing the longitudinal direction of the main body. The projection 19 is provided at the side opposite to the seal groove 17 across the screw hole 18, and projects upward from the coupling upper end portion 16. The projection 19 includes an upward contact surface 19a (see FIG. 10), and the contact surface 19a of the projection 19 is formed of a horizontal upper end surface in example 1.

[0033] A hollow portion 20 extending along the back side (lower side) of the coupling upper end portion 16 and over the whole length of the side wall 12 in the longitudinal direction is integrally formed in each of the side walls 12. The screw hole 18 connects the hollow portion 20 to the outside. A support protrusion 21 extending over the whole length of the side wall 12 in the longitudinal direction is integrally formed on the inner surface of the side wall 12 at substantially the center in the height direction.

[0034] Further, an upper self-tapping hole 22 facing the hollow portion 20 is formed in the side wall 12. Together with this, lower self-tapping holes 23 are respectively formed at corners where the side walls 12 are continuous with the bottom wall 13. The lower self-tapping holes 23 are opened downward of the main body 11.

[0035] The waterproof ring 25 is formed of an elastically deformable material, such as rubber, into a quadrilateral shape, for example, a rectangular ring shape corresponding to the size of the main body 11. As shown in FIG. 4 and FIG. 5, a longer part 25a of the waterproof ring 25 is fitted in the seal groove 17 and is supported by the coupling upper end portion 16. A shorter part 25b of the waterproof ring 25 is disposed to extend between the ends of the parallel coupling upper end portions 16. As shown in FIG. 10 and FIG. 11, the sectional shape of each part of the waterproof ring 25 is circular in a free state, and the diameter is larger than the height dimension of the shorter groove wall 17b and is smaller than the height dimension of the taller groove wall 17a.

[0036] The floodlight panel 28 is formed of a translucent material, for example, a glass plate, and has a quadrilateral shape larger than the waterproof ring 25, for example, a rectangular shape. The floodlight panel 28 is disposed over the parallel coupling upper end portions 16 while an edge part along the longitudinal direction is positioned above the seal groove 17. By this, the floodlight panel 28 is supported by the waterproof ring 25 in contact with the peripheral part from below. The longer edge part of the floodlight panel 28 is adjacent to the taller groove wall 17a of the seal groove 17. By that, the floodlight panel 28 is positioned in the width direction of the main body 11 while the groove wall 17a is used as a stopper.

[0037] The two straight upper edge members 31 are obtained by cutting a metal mold member, for example, an extrusion molded member of aluminum alloy to have the same length as the main body 11. As shown in FIG. 4 and FIG. 8 to FIG. 11, each of the upper edge members 31 includes a press edge 32, a self-tapping hole 33, plural screw holes 34 and a contact portion 35.

[0038] The press edge 32 is formed to integrally protrude sideways from the upper end portion of the upper edge member 31. A buffer member 36 (see FIG. 8, FIG. 10, FIG. 11) made of rubber or elastomer is bonded to the lower surface of the press edge 32 and a corner portion continuous with the root of the press edge. The self-tapping hole 33 is provided at a position separated from the press edge 32 by a predetermined distance in the width direction of the upper edge member 31 so as to pass through the upper edge member 31 in the longitudinal direction. In order to reduce the material cost of the upper edge member 31 and to reduce the weight, the upper edge member 31 includes a hollowed portion 33a (see FIG. 10) at the lower side of the self-tapping hole 33 and in parallel thereto. The hollowed portion 33a may be omitted.

[0039] The screw holes 34 are provided at distant in the longitudinal direction of the upper edge member 31. The screw holes 34 pass through the upper edge member 31 in an up-and-down direction and are perpendicular to the self-tapping hole 33.

[0040] The contact portion 35 is provided at the side opposite to the press edge 32 across the self-tapping hole 33, and extends over the whole length of the upper edge member 31 in the longitudinal direction. The contact portion 35 is formed to correspond to the shape of the projection 19, and includes a contact surface 35a (see FIG. 10) which contacts the contact surface 19a of the projection 19. The contact surface 35a is formed of, for example, a horizontal surface.

[0041] The upper edge members 31 are respectively coupled to the coupling upper end portions 16 by coupling

screws 37 (see FIG. 8, FIG. 10, FIG. 11) which are inserted into the respective screw holes 34 from above and are screwed in the respective screw holes 18 of the coupling upper end portions 16. The press edge 32 of the upper edge member 31 covers the longer edge part of the floodlight panel 28 from above. Moreover, the contact portion 35 contacts the projection 19 of the coupling upper end portion 16 from above.

[0042] When the upper edge member 31 is secuered, the panel fastening structure is formed. That is, the longer edge part of the floodlight panel 28 is clamped between the waterproof ring 25 and the press edge 32 of the upper edge member 31 from above and below, and waterproofing between these is ensured. In detail, the longer edge part of the floodlight panel 28 is pressed downward through the buffer member 36, because the coupling screw 37 is tightened. Since the waterproof ring 25 is compressed and is elastically deformed, the waterproof ring 25 is brought into close contact with the inner surface of the seal groove 17, and is brought into close contact with the lower surface of the longer edge part of the floodlight panel 28.

[0043] The metal press edge 32 does not directly contact the longer edge part of the glass floodlight panel 28 by the buffer operation of the buffer member 36 in screwing or the like. Thus, application of excessive stress to the floodlight panel 28 is suppressed, and damage of the floodlight panel 28 is prevented.

[0044] Since the two upper edge members 31 cover the parallel edge parts of the floodlight panel 28 and are screwed to the coupling upper end portions 16, as shown in FIG. 8, a groove 38 having the floodlight panel 28 as a bottom is formed by assembling of these. The groove 38 extends over the whole length of the main body 11 in the longitudinal direction.

[0045] Further, in the state where the upper edge member 31 is coupled to the coupling upper end portion 16, a gap g (see FIG. 8) is formed between the upper edge member 31 and the coupling upper end portion 16 except for a contact place between the projection 19 and the contact portion 35.

[0046] Since the gap g and the contact place are provided, as the upper edge member 31 is screwed to the coupling upper end portion 16, the upper edge member 31 can certainly press the edge part of the floodlight panel 28 from above.

[0047] That is, the screwing of the upper edge member 31 to the coupling upper end portion 16 is performed such that in the state where the press edge 32 of the upper edge member 31 is placed on the longer edge part of the floodlight panel 28 from above, the coupling screw 37 passes through the screw hole 34 of the upper edge member 31 from above, and the coupling screw 37 is screwed into the screw hole 18 of the coupling upper end portion 16.

[0048] In this case, the position of the screw hole 34 is shifted in the width direction of the upper edge member 31 with respect to the press edge 32 in contact with the floodlight panel 28 through the buffer member 36, and the gap to enable tightening of the coupling screw 37 is provided between the coupling upper end portion 16 and the upper edge member 31.

[0049] Thus, if the projection 19 and the contact portion 35 do not exist, as the coupling screw 37 is screwed, the upper edge member 31 is inclined around an upper ridge line of the longer edge part of the floodlight panel 28 as a fulcrum, and a portion of the press edge 32 closer to the tip is more separated from the upper surface of the floodlight panel 28. As a result, the longer edge part of the floodlight panel 28 cannot be sufficiently pressed from just above the waterproof ring 25. Thus, the close contact between the waterproof ring 25 and the floodlight panel 28 becomes weak, and the waterproof performance of the waterproof ring 25 may decrease.

[0050] However, the malfunction as stated above may be resolved by providing the projection 19 to the coupling upper end portion 16 and by providing the contact portion 35 to the upper edge member 31, which contacts the projection 19 from above.

[0051] That is, at the initial stage of screwing the upper edge member 31, as described above, in the state where the press edge 32 of the upper edge member 31 is placed on the longer edge part of the floodlight panel 28 from above, the coupling screw 37 passes through the screw hole 34 of the upper edge member 31 from above, and the coupling screw 37 is screwed into the screw hole 18 of the coupling upper end portion 16. In this case, the gap g2 to allow tightening of the coupling screw 37 is provided between the coupling upper end portion 16 and the upper edge member 31 (see FIG. 11). This gap g2 is narrower than another gap g1 between the coupling upper end portion 16 and the upper edge member 31.

[0052] When screwing of the coupling screw 37 proceeds from this state, first, the contact portion 35 butts the projection 19 from above, and the upper edge member 31 is supported by the projection 19 from below. Thus, after this situation, a position of the contact portion 35 in the upper edge member 31 does not move down in accordance with the progress of screwing. The position of the screw hole 34 is apart in the width direction of the upper edge member 31 with respect to the press edge 32 in contact with the floodlight panel 28 through the buffer member 36, and the projection 19 and the contact portion 35 are positioned at the side opposite to the press edge 32 across the screw hole 34.

[0053] Thus, as the coupling screw 37 is further screwed, the upper edge member 31 is fastened to the coupling upper end portion 16 while the contact place between the projection 19 and the contact portion 35 is a fulcrum, the coupling screw 37 is the point of a lever where force is applied, and the part where the press edge 32 presses the floodlight panel 28 just above the longer part 25a of the waterproof ring 25 is a point of application. In this case, since the gap g (see FIG. 8) is provided between the upper edge member 31 and the coupling upper end portion 16 except for the contact place be-

tween the contact portion 35 of the upper edge member 31 and the projection 19, as the screwing proceeds, the moment to move the press edge 32 downward is given to the upper edge member 31 while the contact place between the projection 19 and the contact portion 35 is the fulcrum. Accordingly, the upper edge member 31 can certainly press the edge part of the floodlight panel 28 from just above the longer part 25a of the waterproof ring 25. Hence, the waterproof property of the waterproof ring 25 can be made certain, because the close contact between the floodlight panel 28 and the waterproof ring 25 is intensified.

[0054] In the example 1, although the projection 19 is provided to the coupling upper end portion 16, instead of this, the projection 19 projecting downward is provided to the upper edge member 31, and the contact surface with which the tip of the projection 19 contacts may be provided to the coupling upper end portion 16. In this case, the contact surface of the coupling upper end portion 16 may be formed of a bottom of a recessed portion corresponding to the projection 19, or no recessed portion is provided, but the contact surface may be formed of a plane having the same height as and continuous with the surface of the coupling upper end portion 16 where the upper end of the screw hole 18 is opened.

[0055] As shown in FIG. 8, the light source unit 41 includes a unit base 42, for example, plural light-emitting modules 44 (only one is shown), lenses 49 the number of which is equal to the number of the light-emitting modules 44, luminous intensity distribution control members, specifically, louvers 52, the number of which is equal to the number of the light-emitting modules 44, a power supply unit 55, and so on.

[0056] The unit base 42 is obtained by cutting a metal mold member, for example, an extrusion molded member of aluminum alloy to have a length slightly shorter than the main body 11. The unit base 42 includes engagement grooves 42a opened on both sides in the width direction and a groove portion 42b opened upward, and these extend over the whole length of the unit base 42 in the longitudinal direction.

[0057] The light-emitting module 44 is formed by mounting plural light-emitting parts 46 (only one is shown) and a pair of electric wire connectors 47 (only one is shown) on, for example, a rectangular substrate 45. The whole length of the substrate 45 is shorter than the whole length of the unit base 42. FIG. 8 shows a section of the substrate 45 in the short direction (width direction) perpendicular to the longitudinal direction.

[0058] The respective light-emitting parts 46 are positioned at, for example, the center of the substrate 45 in the short direction, and are mounted at constant distants in the longitudinal direction of the substrate 45. The light-emitting parts 46 are connected electrically in series to each other through a wiring pattern of the substrate 45. For these light-emitting parts 46, an LED including, for example, an LED package is used. Therefore, the light-emitting module 44 is an LED light-emitting module, and the luminaire 1 including the light-emitting module is an LED luminaire.

[0059] The LED package is formed such that an LED chip is mounted on a base provided with an electrode, a reflecting body including a truncated cone recess portion containing the LED chip is mounted, and a translucent sealing resin containing fluorescent material is filled in the recess portion. In this LED package, since the LED chip to emit blue light is used, a yellow fluorescent material is used to obtain white illumination light.

[0060] Since light emission of the LED is realized by applying a forward current to the p-n junction of a semiconductor, the LED is a solid element to directly convert electric energy into light. The semiconductor light-emitting element to emit light on the basis of the light emission principle as stated above has an energy-saving effect as compared with an incandescent lamp in which a filament is heated to a high temperature by applying power and visible light is emitted by the heat radiation.

[0061] The electric wire connectors 47 are respectively mounted on both ends of the module substrate 45 in the longitudinal direction. The ends of a line including the plural light-emitting parts 46 disposed between the electric wire connectors 47 are electrically connected to the electric wire connectors. Further, the light-emitting modules 44 adjacent to each other are electrically connected in series to each other through an electric wire provided between the electric wire connectors 47.

[0062] The respective light-emitting modules 44 are fitted in the groove portion 42b from above. The light-emitting part 46 is turned upward and the light-emitting module 44 is fixed to the unit base 42 by a screw screwed in the unit base 42 through the module substrate 45. Incidentally, reference numeral 42c in FIG. 8 denotes a screw hole in which the screw for fixing the module substrate is screwed. By the screwing, the respective light-emitting modules 44 are disposed on the unit base 42 at intervals in the longitudinal direction, and are preferably disposed at regular intervals.

[0063] Each of the lenses 49 is made of an integral molded part of translucent synthetic resin, and includes a lens portion 49a and plural attachment legs 49b provided to protrude at both sides of the lens portion 49a. The lens portion 49a has a length extending over the plural light-emitting parts 46 of the one light-emitting module 44, and includes a light incident surface 49c. The shapes of the sections of the lenses 49 perpendicular to the longitudinal direction are the same. Incidentally, although the number of the lenses 49 is equal to the number of the light-emitting modules 44, one lens having the same length as the whole length of the main body 11 may be used.

[0064] Each of the lenses 49 is fixed to the unit base 42 to cover the light-emitting module 44 from above by a screw 50 screwed in the unit base 42 through the attachment leg 49b. The light incident surface 49c of the lens 49 is provided just above the light-emitting part 46. In order to accurately regulate the distance between the

light-emitting part 46 and the light incident surface 49c, part of the attachment legs 49b contact upper surfaces of both side portions of the module substrate 45 in the width direction. Incidentally, reference numeral 42d in FIG. 8 denotes a screw hole in which the lens fixing screw 50 is screwed.

[0065] The louver 52 is a press working product of sheet metal, and includes plural, for example, two louver pieces 52a, and plural louver legs 52b. The louver piece 52a is provided to be bent upward. The length of the louver 52 is substantially equal to the length of the one light-emitting module 44. Incidentally, the louver 52 may be one louver having the same length as the whole length of the main body 11.

[0066] The louver 52 is fixed to the unit base 42 so as to cover the lens 49 by fastening the louver leg 52b by the screw 50. The louver piece 52a of the louver 52 is disposed to be perpendicular to the light emitting surface of the lens 49.

[0067] The power supply unit 55 supplies power to the respective light-emitting modules 44 and causes the respective light-emitting parts 46 to emit light, and is screwed to the lower surface of the unit base 42. Incidentally, reference numeral 42e in FIG. 8 denotes a screw hole in which a screw for fixing the power supply unit is screwed. Besides, another electric part, for example, a terminal stand to which a power supply line is connected, or a surge protector is also attached to the lower surface of the unit base 42.

[0068] The engagement groove 42a of the light source unit 41 having the above structure is fitted to the support protrusion 21 of the main body 11, and the light source unit is inserted from one end of the main body 11 in the longitudinal direction to the other end. As a result, the light source unit is incorporated in the main body 11 on which the floodlight panel 28 is mounted, and is supported between the opposed side walls 12 of the main body 11. The light-emitting part 46 of the light source unit 41 incorporated in the main body 11 emits illumination light passing through the floodlight panel 28 upward by the light-emitting operation.

[0069] The waterproof member 61 is made of an elastically deformable material such as synthetic rubber. The waterproof member 61 is formed to have such a size as to cover the end face of the main body 11 in the longitudinal direction, the end face of the upper edge member 31 in the longitudinal direction, and the end face of the floodlight panel 28 in the longitudinal direction, and is disposed to contact the end faces.

[0070] As shown in FIG. 2 to FIG. 4 and FIG. 7, a first recess portion 62 is formed at the upper end portion of the waterproof member 61, and a clearance groove 63 is formed at one side portion of the waterproof member 61. The clearance groove 63 is provided to cause the ends of the groove 14 and the groove wall 14a in the longitudinal direction to be exposed. Further, as shown in FIG. 5 and FIG. 6, the waterproof member 61 is provided with a fitting hole 64 and a ring fitting groove 65.

[0071] The first recess portion 62 is opened upward of the waterproof member 61. The length of the first recess portion 62 in the width direction of the waterproof member 61 is equal to the width of the groove 38 formed between the parallel upper edge members 31. The first recess portion 62 is continuous with the end of the groove 38. The height of a bottom 62a of the first recess portion 62 is equal to or lower than the upper surface of the floodlight panel 28. Further, the bottom 62a of the first recess portion 62 is inclined to gradually descend toward the center portion in the longitudinal direction. Thus, as shown in FIG. 3, in the end face of the floodlight panel 28 in the longitudinal direction, a flat triangular area having the upper surface of the floodlight panel 28 as the base is not covered with the water proof member 61 and is exposed.

[0072] The fitting hole 64 is provided at an upper part of the waterproof member 61 and at the lower side of the first recess portion 62, and extends in the width direction of the waterproof member 61 as shown in FIG. 4. The length of the fitting hole 64 in the width direction is substantially equal to the separation size between the parallel coupling upper end portions 16. The opening of the fitting hole 64 is opened in the outside surface of the waterproof member 61, and the depth side of the fitting hole 64 is closed as shown in FIG. 5 and FIG. 6.

[0073] The ring fitting groove 65 is provided separately above the fitting hole 64, and is opened upward. An inter-side wall part made of the shorter part 25b of the waterproof ring 25 is fitted in the ring fitting groove 65 from above. The waterproof member 61 includes a ring support portion 66. As shown in FIG. 6 and FIG. 7, the ring support portion 66 is formed of a part between the ring fitting groove 65 and the fitting hole 64. In other words, the ring fitting groove 65 is formed at the upper part of the ring support portion 66. Thus, the ring support portion 66 supports the inter-side wall part made of the shorter part 25b of the waterproof ring 25, which is disposed to be fitted in the ring fitting groove 65, from below.

[0074] The side plate 71 is a die cast product of metal, for example, aluminum alloy. The side plate 71 is coupled to the end portion of the main body 11 while the waterproof member 61 is sandwiched between the side plate and the end face of the main body 11 in the longitudinal direction, the end face of the floodlight panel 28 in the longitudinal direction, and the end face of the upper edge member 31 in the longitudinal direction.

[0075] This coupling is realized by a screw 72 (see FIG. 2) screwed in the upper self-tapping hole 22 of the main body 11 through the side plate 71 and the waterproof member 61, a screw 73 (see FIG. 2) screwed in the lower self-tapping hole 23 of the main body 11 through the side plate 71 and the waterproof member 61, and a screw 74 (see FIG. 2) screwed in the self-tapping hole 33 of the upper edge member 31 through the side plate 71 and the waterproof member 61. Self-tapping screws are preferably used as the screws 72 to 74.

[0076] When the self-tapping screw is used, a part of the self-tapping hole is shaved by the screwing and shav-

ings are produced. The shavings produced from the upper self-tapping hole 22 drop into the hollow portion 20 and are retained. The lower self-tapping hole 23 is separated from the inside of the main body 11, and the shavings produced from the lower self-tapping hole 23 are discharged through the opening to the outside of the main body 11. The self-tapping hole 33 is provided outside the main body 11, and the shavings produced from the self-tapping hole 33 are retained in the inside of the self-tapping hole 33. Accordingly, there is no disadvantage that the shavings adhere to the light source unit 41 and the floodlight panel 28, and cause short circuit, defective insulation, defective withstand voltage and the like.

[0077] Incidentally, also when a self-tapping screw is used as the coupling screw 37 for fixing the upper edge member 31, shavings produced by screwing drop into the hollow portion 20 and are retained. Since the hollow portion 20 to receive such shavings is provided in the main body 11, the number of stripe-shaped openings opened in the outside surface of the main body 11 is reduced. Thus, the outer appearance of the luminaire 1 can be improved, and the number of parts where there is a possibility that rainwater or the like collects can be reduced, which is preferable.

[0078] As shown in FIG. 7 and the like, the side plate 71 includes a clearance groove 75, a second recess portion 76 and a support protrusion 77.

[0079] The clearance groove 75 formed at one side portion of the side plate 71 communicates with the clearance groove 63 of the waterproof member 61, and cooperates with the clearance groove 63 to cause the end of the groove 14 and the end of the groove wall 14a in the longitudinal direction to be exposed. By this, the bolt holder 2 and the bolt 3 can be inserted from the end of the luminaire 1 in the longitudinal direction.

[0080] The second recess portion 76 is provided to be opened upward at the upper end of the side plate 71. The length of the second recess portion 76 along the width direction of the side plate 71 is equal to the length of the first recess portion 62. As shown in FIG. 6, the second recess portion 76 is continuous with the end of the groove 38 through the first recess portion 62. The height of the bottom 76a of the second recess portion 76 is equal to or lower than the upper surface of the floodlight panel 28.

[0081] Further, the bottom 76a of the second recess portion 76 is inclined. The inclination is for causing the bottom 76a to become lower than the upper surface of the floodlight panel 28. For example, as shown in FIG. 6, the bottom is inclined to gradually descend toward the surface opposite to the back surface of the side plate 71 in contact with the waterproof member 61, that is, the front side surface. Accordingly, the height of the bottom 76a of the second recess portion 76 is lower than the bottom 62a of the first recess portion 62.

[0082] The support protrusion 77 is provided to protrude at the upper part of the back surface of the side plate 71. As shown in FIG. 5 and FIG. 6, the support protrusion 77 is inserted in the fitting hole 64 of the waterproof member 61, and supports the ring support portion 66 from below.

[0083] As shown in FIG. 2 to FIG. 4, the side plate 71 includes a recess portion 78 opened in the upper surface. The recess portion 78 extends in the width direction of the side plate 71, and communicates with the second recess portion 76 opened at the upper center position of the recess portion 78. Screw holes (not shown) through which the screws 72 pass are provided at both ends of the recess portion 78 in the longitudinal direction.

[0084] When the luminaire 1 having the above structure is assembled, first, the light source unit 41 is made to be incorporated in the main body 11 by the procedure described before. Thereafter, the waterproof members 61 are respectively disposed at the ends of the main body 11 in the longitudinal direction, and the side plates 71 are respectively disposed so as to overlap the outer surfaces of the water-proof members. Then, the waterproof members 61 and the side plates 71 are temporarily fitted to the ends of the main body 11 by using the screws 72 and 73. With this, the support protrusion 77 of the side plate 71 harder than the waterproof member 61 is inserted in the fitting hole 64 of the waterproof member 61, and the ring support portion 66 of the waterproof member 61 is supported from below by the support protrusion 77. Further, with this, the end in the longitudinal direction of the ring fitting groove 65 formed on the ring support portion 66 is disposed to be continuous with the end in the longitudinal direction of the seal groove 17 of the main body 11 at right angles.

[0085] Next, in this state, the waterproof ring 25 is disposed to be fitted into the seal groove 17 and the ring fitting groove 65 from above. Accordingly, although the shorter part 25b of the waterproof ring 25 extends between the parallel coupling upper end portions 16 of the main body 11, the shorter part 25b can be supported from below by the ring support portion 66 by using the waterproof member 61 so that the shorter part 25b does not hang down.

[0086] Thereafter, the floodlight panel 28 is disposed so that the peripheral part is put on the waterproof ring 25. In this case, the position of the floodlight panel 28 in the width direction with respect to the main body 11 is regulated by the groove wall 17a, and the position of the floodlight panel 28 in the longitudinal direction with respect to the main body 11 is regulated by the upper part of the waterproof member 61.

[0087] Next, the upper edge members 31 are respectively screwed to the coupling upper end portions 16 of the main body 11 by the procedure described before. By that, the waterproof ring 25 is compressed from above through the floodlight panel 28, and the waterproof ring 25 and the lower surface of the peripheral part of the floodlight panel 28 are brought into close contact. With this, the peripheral surface of the longer part 25a of the elastically deformed waterproof ring 25 is brought into close contact with the surface of the seal groove 17, and

the peripheral surface of the shorter part 25b of the waterproof ring 25 is brought into close contact with the surface of the ring fitting groove 65.

[0088] In this case, since the ring support portion 66 having the ring fitting groove 65 is supported from below by the harder support protrusion 77, the elastic deformation of the shorter part 25b is certainly performed. Accordingly, the close contact can be certainly performed by the lower surface of the floodlight panel 28 and the surface of the ring fitting groove 65. By the close contact of these, waterproofing between the waterproof ring 25 and the floodlight panel 28 is ensured, and waterproofing between the waterproof ring 25 and the seal groove 17 and the ring fitting groove 65 is ensured. That is, waterproofing around the waterproof ring can be ensured.

[0089] Finally, the screws 72 and 73 are further tightened, so that the side plate 71 is fixed to the end of the main body 11 while the waterproof member 61 is sandwiched between the side plate and the end face of the main body 11. Further, the screw 74 is screwed into the self-tapping hole 33, and the side plate 71 is fixed to the end of the upper edge member 31 while the waterproof member 61 is sandwiched between the side plate and the end face of the upper edge member 31. With that, the elastically deformed waterproof member 61 ensures waterproofing between the waterproof member and the end face of the main body 11, the end face of the floodlight panel 28, and the end face of the upper edge member 31, and waterproofing between the waterproof member 61 and the side plate 71 is ensured.

[0090] In the above assembling, as shown in FIG. 5, since the waterproof member 61 contacts the end face of the unit base 42 in the longitudinal direction, the light source unit 41 can be positioned in the longitudinal direction of the main body 11 so that the light source unit 41 does not move carelessly along the support protrusion 21.

[0091] Incidentally, if the ring support portion 66 having no ring fitting groove 65, that is, the ring support portion 66 in which the portion in contact with the inner periphery of the waterproof ring 25 in FIG. 5 is omitted is adopted, the luminaire 1 can be assembled also by the following procedure without using the above assembling procedure.

[0092] First, after the waterproof ring 25 is set in the seal grooves 17 of the parallel coupling upper end portions 16 of the main body 11, the floodlight panel 28 is put thereon, and the upper edge members 31 are respectively screwed to the coupling upper end portions 16 by the procedure described before. Next, the waterproof member 61 is disposed so as to cover the end face of the main body 11, the end face of the floodlight panel 28, and the end face of the upper edge member 31. In this case, the ring support portion 66 of the waterproof member 61 is positioned at the lower side of the shorter part 25b of the waterproof ring 25 between the parallel seal groove 17, and the waterproof member 61 is moved upward so that the waterproof member 61 is disposed at a proper position. By that, the shorter part 25b can be supported from below by the ring support portion 66. Thereafter, the side plate 71 is laid on the waterproof member 61, and the side plate 71 is screwed to the main body 11 and the end of the upper edge member 31 by using the screws 72 to 74. With these steps, the assembling of the luminaire 1 is completed.

[0093] The luminaire 1 having the above structure is installed outdoors as the floodlight in the substantially horizontal state in which the floodlight panel 28 is turned upward in order to illuminate a wall surface of a building. When the light-emitting part 46 of the light source unit 41 of the luminaire 1 emits light, the emitted upward illumination light is first incident on the lens 49, the projection angle is widened in the width direction of the main body 11 by the lens 49, and the light is emitted from the upper surface (light emitting surface) of the lens 49. The emitted light passes upward through the floodlight panel 28 existing just above the lens 49. By that, wall surface illumination is performed.

[0094] Heat generated by the LED chip of the light-emitting part 46 at the time of lighting is conducted to the metal unit base 42 through the module substrate 45, and is further conducted to the metal main body 11 from the unit base 42, and is discharged to the outside from the outer surface of the main body 11. Thus, excessive temperature rise of the LED chip is suppressed, and reduction of light-emitting efficiency can be suppressed.

[0095] In the luminaire 1 having the above structure, attachment of the floodlight panel 28 to the main body 11 is performed such that the upper edge members 31 respectively coupled to the coupling upper end portions 16 of the opposed side walls 12 of the main body 11 press the parallel edge parts of the floodlight panel 28 from above, and the edge parts of the floodlight panel 28 are pressed to the waterproof ring 25.

[0096] By this structure, since the groove 38 having the floodlight panel 28 as the bottom is formed between the two parallel upper edge members 31, in the luminaire 1 installed outdoors, rainwater or the like can collect in the groove 38, as described above.

[0097] However, in the luminaire 1, the waterproof member 61 and the side plate 71 provided to close and waterproof the end of the main body 11 in the longitudinal direction include the first recess portion 62 or the second recess portion 76 communicating with the groove 38, and the heights of the bottoms 62a and 76a of the recess portions 62 and 76 are equal to or lower than the upper surface of the floodlight panel 28.

[0098] Thus, the water collecting in the groove 38 is not dammed by the waterproof member 61 and the side plate 71, and the water can be discharged to the outside of the groove 38 through the first recess portion 62 and the second recess portion 76. In this case, since the groove 38 where the water collects extends straight, the movement of the water in the drainage direction in the groove 38 is easy.

[0099] Further, since the bottom 62a of the first recess

portion 62 of the waterproof member 61 is inclined to gradually descend toward the center from both ends in the longitudinal direction of the first recess portion 62, the water reaching the first recess portion 62 from the groove 38 is collected to the center in the longitudinal direction as the lowest position of the first recess portion 62 in accordance with the inclination of the bottom 62a, and is discharged to the second recess portion 76. Since the water is collected and discharged as stated above, the water can be smoothly discharged from the first recess portion 62 to the second recess portion 76.

[0100] Further, the bottom 76a of the second recess portion 76 is inclined so that the bottom gradually becomes lower than the upper surface of the floodlight panel 28 and the bottom 62a of the first recess portion 62 in the direction of moving away from the end face of the floodlight panel 28 and the waterproof member 61. Thus, the water discharged from the first recess portion 62 to the second recess portion 76 can be smoothly guided and discharged by the inclination of the bottom 76a of the second recess portion 76.

[0101] Since water can be prevented from remaining in the groove 38 by the drainage as stated above, even when the waterproof ring 25 is deteriorated and the waterproof performance is reduced, water immersion into the main body 11 from the periphery of the floodlight panel 28 can be prevented. Further, it is possible to prevent that water collects in the groove 38, the surface of the floodlight panel 28 becomes dirty by drying of the water, and the brightness is reduced due to the dirt. Further, since water is hard to collect also in the first recess portion 62 and the second recess portion 76 because of the smooth drainage, water immersion into the contact portion between the waterproof member 61 and the end face of the main body 11 and the end face of the floodlight panel 28 can also be suppressed.

[Example 2]

[0102] FIG. 12 and FIG. 13 show example 2. Since the example 2 is different from the example 1 in components described below and the other components are the same as those of the example 1, the components having the same or like functions as those of the example 1 are denoted by the same reference numerals in example 1 and their description is omitted.

[0103] A luminaire 1 of the example 2 further includes an end cover 81 to cover an end of a floodlight panel 28 in a longitudinal direction, a first recess portion 62 and a second recess portion 76. The end cover 81 is made of synthetic resin or metal, and the end cover 81 formed by bending, for example, an aluminum plate is used in the example 2.

[0104] The end cover 81 mounted to each of both ends of the luminaire 1 in the longitudinal direction includes a side cover portion 82 and an upper surface cover portion 83.

[0105] The side cover portion 82 is contained in a recess portion 78 of a side plate 71, and is, together with a waterproof member 61 and the side plate 71, fastened to an end of an upper edge member 31 by a screw 74. By this, the end cover 81 laterally covers the end face of the floodlight panel 28, the first recess portion 62 and the second recess portion 76.

[0106] As shown in FIG. 13, the side cover portion 82 is positioned in the recess portion 78. Drainage gaps communicating with each other are formed between the side cover portion 82 and a side surface of an upper end portion 71a where the recess portion 78 of the side plate 71 is formed and between the side cover portion and a bottom of the recess portion 78, and the side cover portion 82 is separated from the side surface and the bottom.

[0107] The upper cover portion 83 is bent at right angles from the upper edge of the side cover portion 82, and covers the end of the floodlight panel 28 in the longitudinal direction, the first recess portion 62, the second recess portion 76 and the recess portion 78 from above.

[0108] Components of the luminaire of the example 2 including not-shown components except the above-described components are the same as those of the example 1. Accordingly, also in the example 2, the problem is solved by the reason described in the example 1, and the luminaire 1 can be provided in which water collecting on the floodlight panel 28 through which light emitted by a light-emitting part passes upward can be discharged. Incidentally, in the luminaire 1, water discharged from the second recess portion 76 passes through the drainage gap and is discharged to the outside.

[0109] Besides, since the luminaire 1 of the example 2 includes the end cover 81, when the luminaire 1 is installed or is maintained, it is possible to prevent that a body carelessly collides against the end of the floodlight panel 28 in the longitudinal direction and the end of the floodlight panel 28 is damaged. Further, since the end of the floodlight panel 28, the first recess portion 62, and the second recess portion 76 are covered with the end cover 81, a neat outer appearance can be imparted to the luminaire 1.

[Example 3]

[0110] FIG. 14 shows example 3. Since the example 3 is different from the example 1 in components described below and the other components are the same as those of the example 1, the components having the same or like functions as those of the example 1 are denoted by the same reference numerals and their description is omitted.

[0111] In the example 3, a contact surface 19a of a projection 19 of a coupling upper end portion 16 and a contact surface 35a of a contact portion 35 of an upper edge member 31 are formed of inclined surfaces which are inclined downward toward a seal groove 17.

[0112] Components of the luminaire of the example 3 including not-shown components except the above-described components are the same as those of the exam-

ple 1. Accordingly, also in the example 3, the problem is solved by the reason described in the example 1, and the luminaire 1 can be provided in which water collecting on a floodlight panel 28 through which light emitted by a light-emitting part passes upward can be discharged.

[0113] Further, since the contact surface 19a and the contact surface 35a in contact with each other are formed of the inclined surfaces, irrespective of the behavior of the upper edge member 31 in accordance with the moment given to the upper edge member 31 by screwing of a coupling screw 37, the contact surface 19a and the contact surface 35a are held in the contact state after the screwing of the coupling screw 37 is ended. That is, since the upper edge member 31 is not screwed to the coupling upper end portion 16 of a main body 11 in a state where a space between the projection 19 and the contact portion 35 is opened in a wedge shape, the outer appearance of the luminaire 1 can be improved.

[0114] Although the respective examples are construed as described above, with respect to the first recess portion 62 of the waterproof member 61, the bottom 62a may be inclined so that the bottom gradually descends toward both ends from the center portion in the longitudinal direction. In this case, with respect to the second recess portion 76 of the side plate 71, the bottom 76a is inclined so that the bottom gradually descends toward both ends from the center portion in the longitudinal direction, and the height position of the bottom of the lowest portion of the bottom 76a is made lower than the height position of the lowest portion of the bottom 62a of the first recess portion 62. Alternatively, the second recess portion 76 has the same structure as that of the example 1, and the height position of the bottom 76a is made lower than the height position of the bottom 62a of the lowest portion of the first recess portion 62. Besides, the inclination of the bottom 62a of the first recess portion 62 and the bottom 76a of the second recess portion 76 may be formed so that the bottoms gradually descend from one end of the respective bottoms in the longitudinal direction toward the other end.

[0115] In the structure including the first recess portion 62 and the second recess portion 76 as described above, since the lowest portion of the bottom 62a of the first recess portion 62 is continuous with the corner portion between the upper surface of the floodlight panel 28 and the press edge 32 of the upper edge member 31, water collecting in the corner portion can be quickly discharged to the outside through the first recess portion 62 and the second recess portion 76.

[0116] Besides, although the respective examples relate to the long luminaire, exemplary examples can be applied to a square luminaire.

[0117] While certain embodiments have been described, these embodiments have been presented by way of example only, and are not intended to limit the scope of the inventions. Indeed, the novel embodiments described herein may be embodied in a variety of other forms; furthermore, various omissions, substitutions and changes in the form of the embodiments described herein may be made without departing from the spirit of the inventions. The accompanying claims and their equivalents are intended to cover such forms or modifications as would fall within the scope and spirit of the inventions.

Claims

1. A luminaire (1) **characterized by** comprising:

   a main body (11) comprising opposed side walls (12) that include coupling upper end portions (16), and seal grooves (17) opening upward and provided over whole lengths of the coupling upper end portions (16);
   a waterproof ring (25) which is made of an elastically deformable material, is shaped into a quadrilateral ring and is fitted in the seal grooves (17);
   a floodlight panel (28) which is disposed over the coupling upper end portions (16) and is supported from below by the waterproof ring (25);
   two upper edge members (31) which are respectively coupled to the coupling upper end portions (16) to press edges of the floodlight panel (28) along the coupling upper end portions (16) to the waterproof ring (25), and form a groove (38) having an upper surface of the floodlight panel (28) as a bottom and located at an upper part of the main body (11);
   a light-emitting part (46) which is incorporated in the main body (11) and emits illumination light passing through the floodlight panel (28) upward;
   an waterproof member (61) configured be formed elastically deformable material which is disposed to cover an end face of the main body (11), end faces of the upper edge members (31), and an end face of the floodlight panel (28), said waterproof member (61) comprising a first recess portion (62) continuous with the groove (38), wherein a height of a bottom (62a) of the first recess portion (62) is equal to or lower than an upper surface of the floodlight panel (28); and
   a side plate (71) configured to be coupled to an end of the main body (11) to press the waterproof member (61) to the end face of the main body (11), said side plate (71) comprising a second recess portion (76) continuous with the groove (38) through the first recess portion (62), wherein a height of a bottom (76a) of the second recess portion (76) is equal to or lower than the upper surface of the floodlight panel (25).

2. The luminaire (1) of claim 1, **characterized in that** at least the bottom (76a) of the second recess portion (76) is inclined to become lower than the upper sur-

face of the floodlight panel (28).

3. The luminaire (1) of claim 1 or 2, **characterized in that**
the waterproof member (61) comprises a ring support portion (66) to support an inter-side wall part (25b) of the waterproof ring (25) extended between the side walls (12) from below.

4. The luminaire (1) of claim 3, **characterized in that** the side plate (71) comprises a support protrusion which is inserted in the waterproof member and supports the ring support portion from below.

5. The luminaire (1) of any one of claims 1 to 4, **characterized in that**
the coupling upper end portion (16) comprises a screw hole (18) in which a coupling screw (37) to fasten the upper edge member (31) is screwed at a position apart from the seal groove (17) in a width direction of the coupling upper end portion (16),
one of the coupling upper end portion (16) and the upper edge member (31) comprises a projection (19) positioned at a side opposite to the seal groove (17) across the screw hole (18), and
the other of the coupling upper end portion (16) and the upper edge member (31) comprises a contact surface (35a) in contact with the projection (19),
the coupling upper end portion (16) and the upper edge member (31) screwed to the coupling upper end portion (16) make a gap (g) therebetween except for a
contact place between the projection (19) and the contact surface (35a).

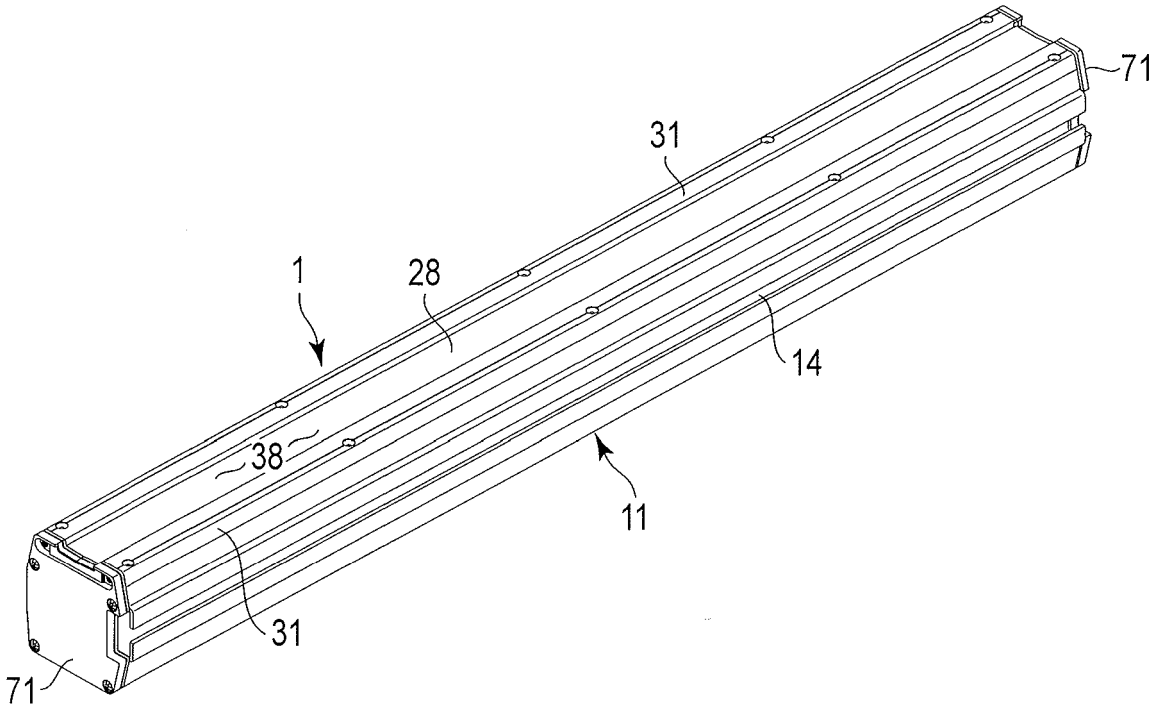

FIG. 1

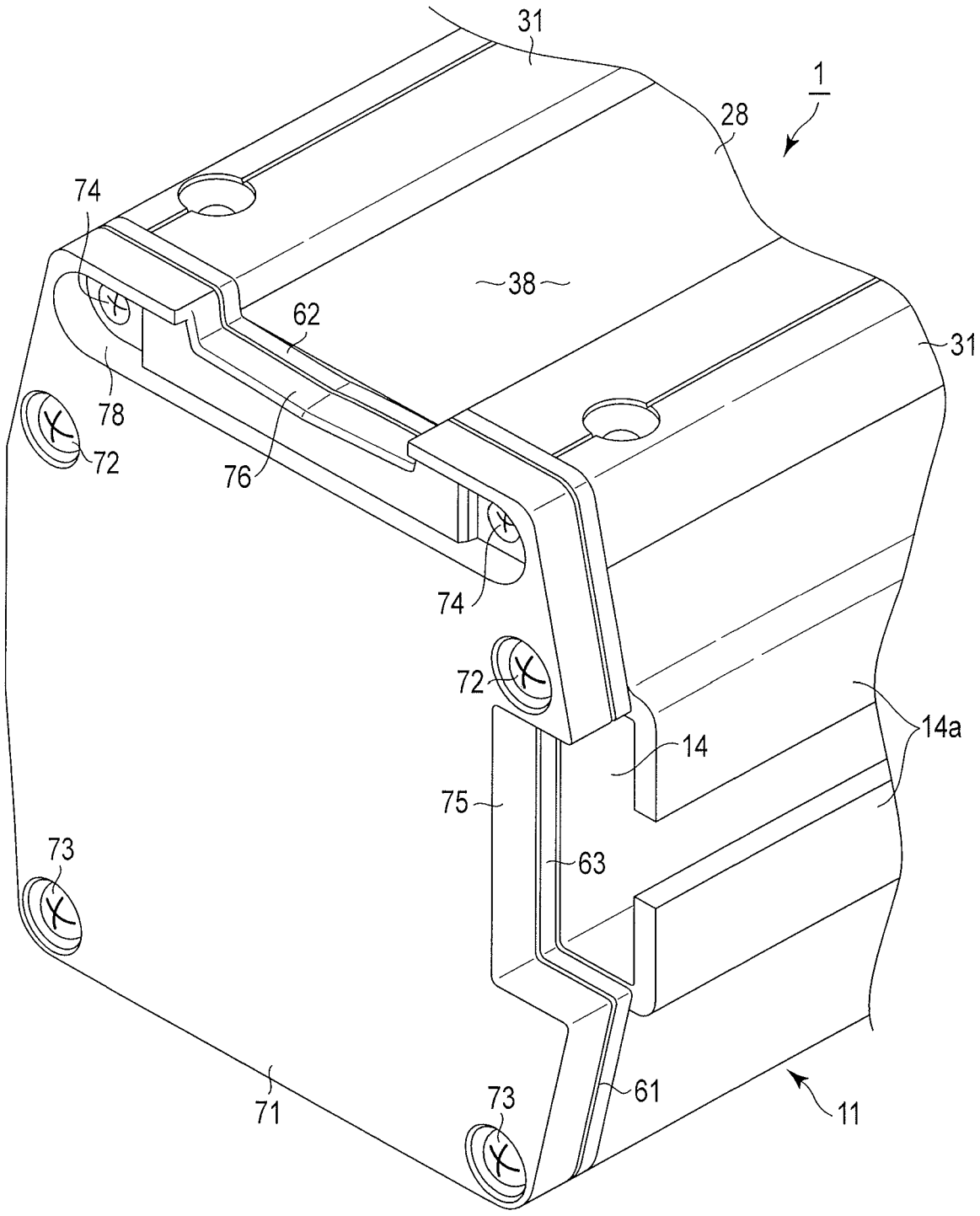

FIG. 2

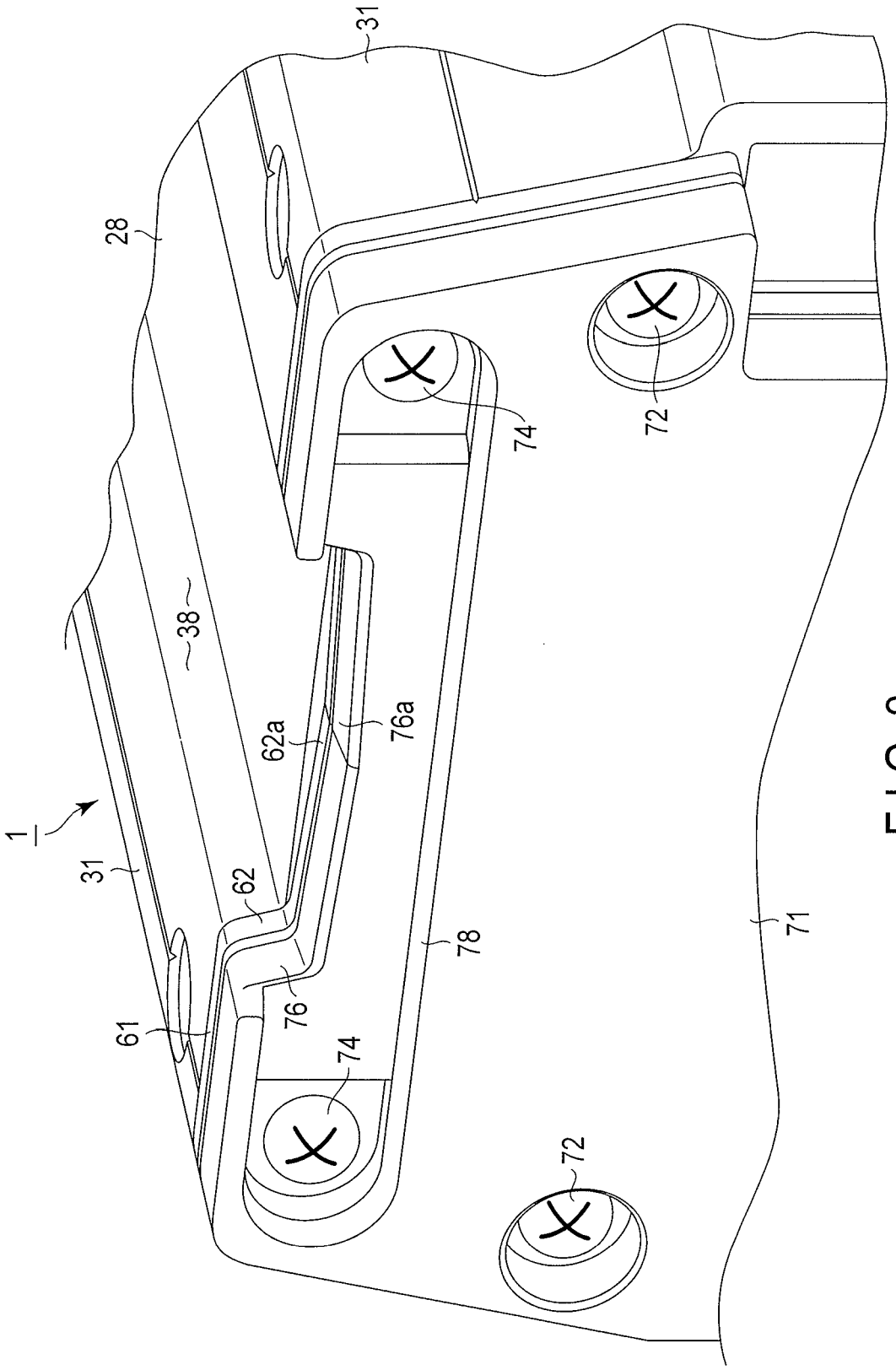

FIG. 3

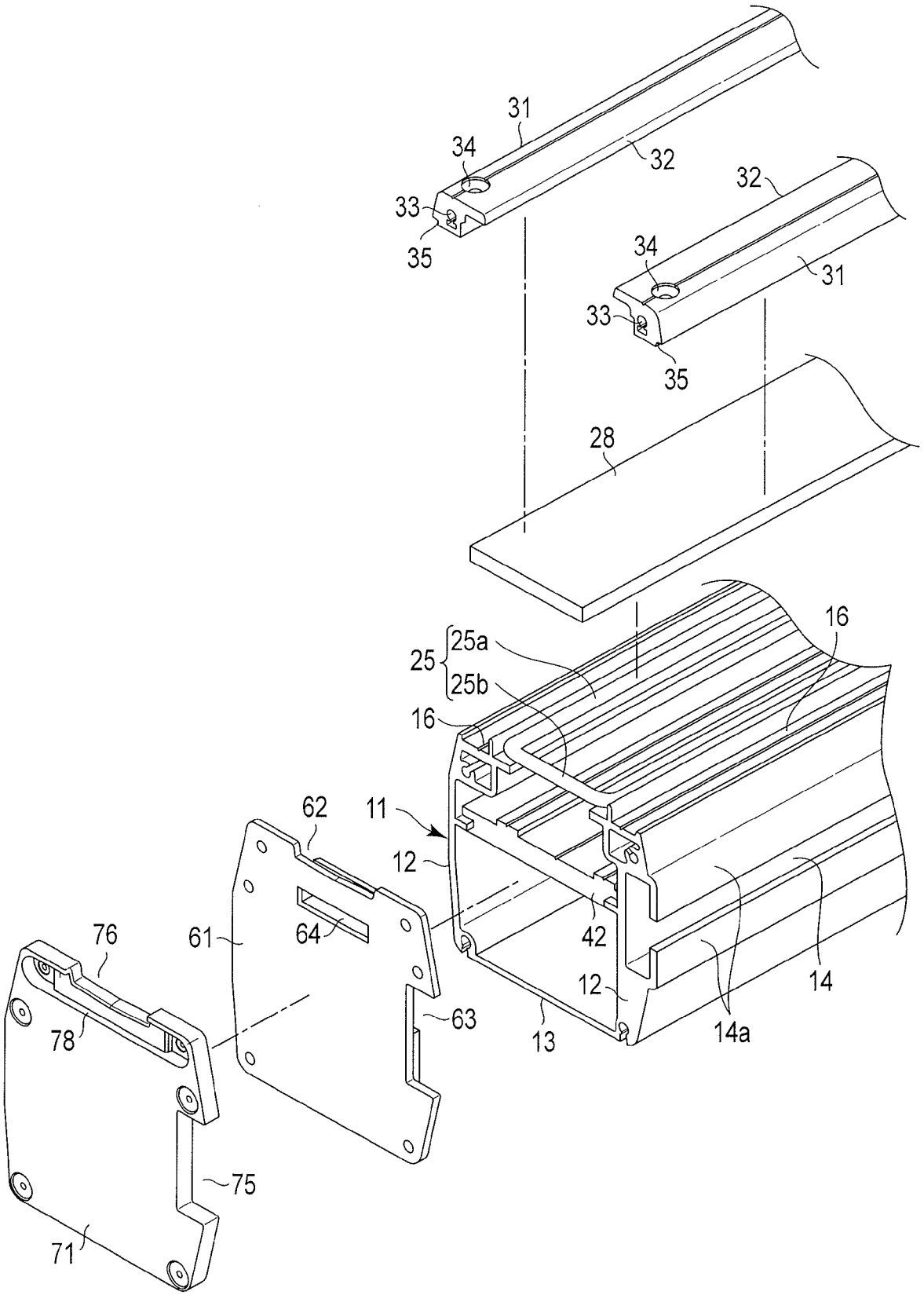
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FIG. 4

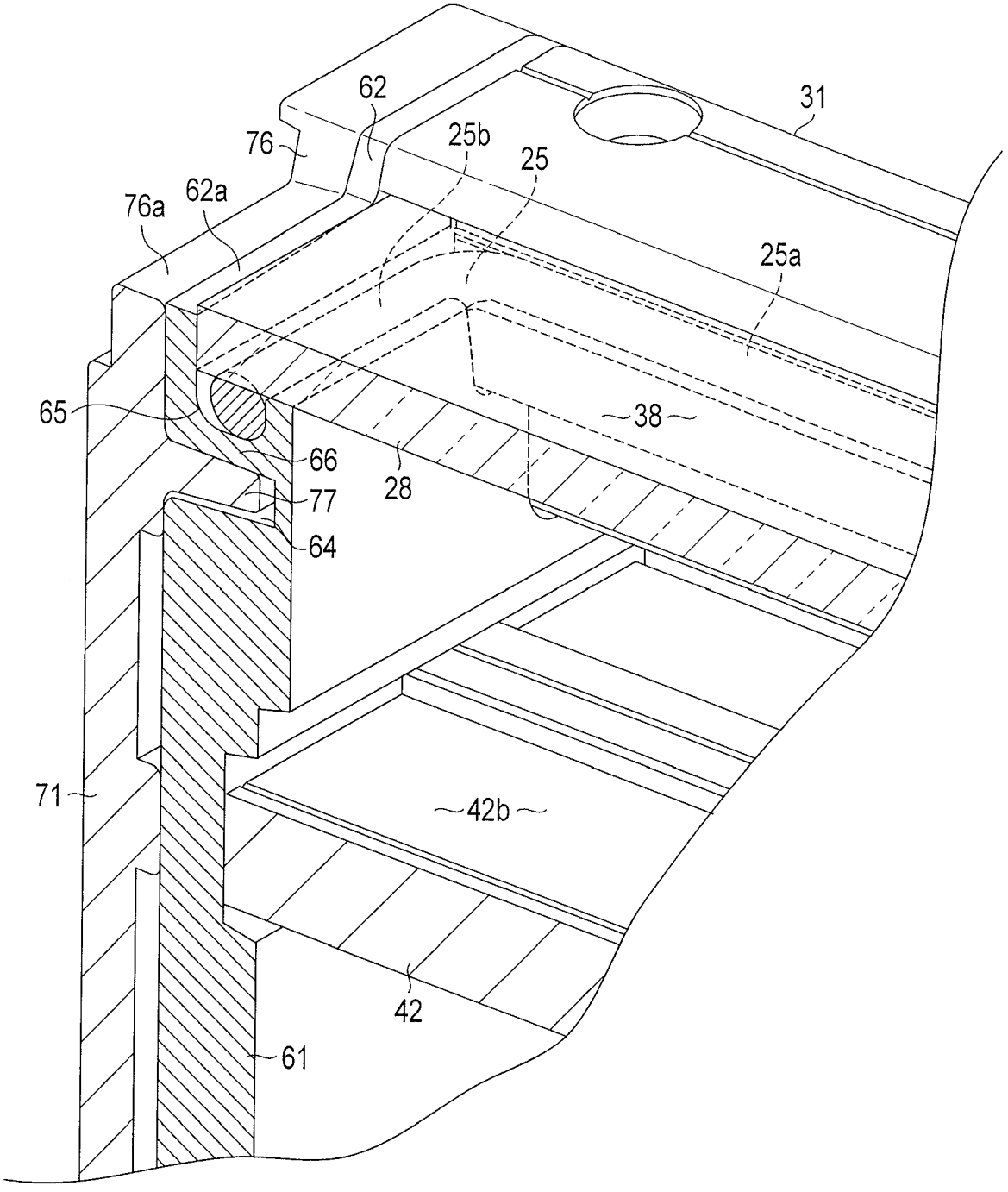

FIG. 5

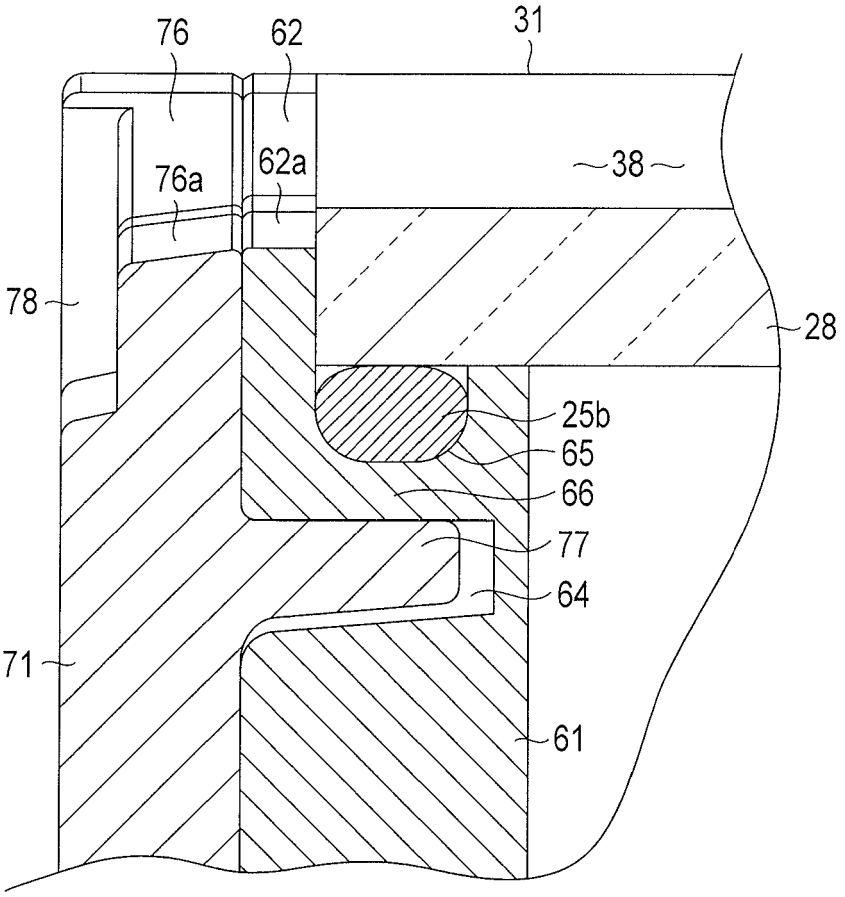

FIG. 6

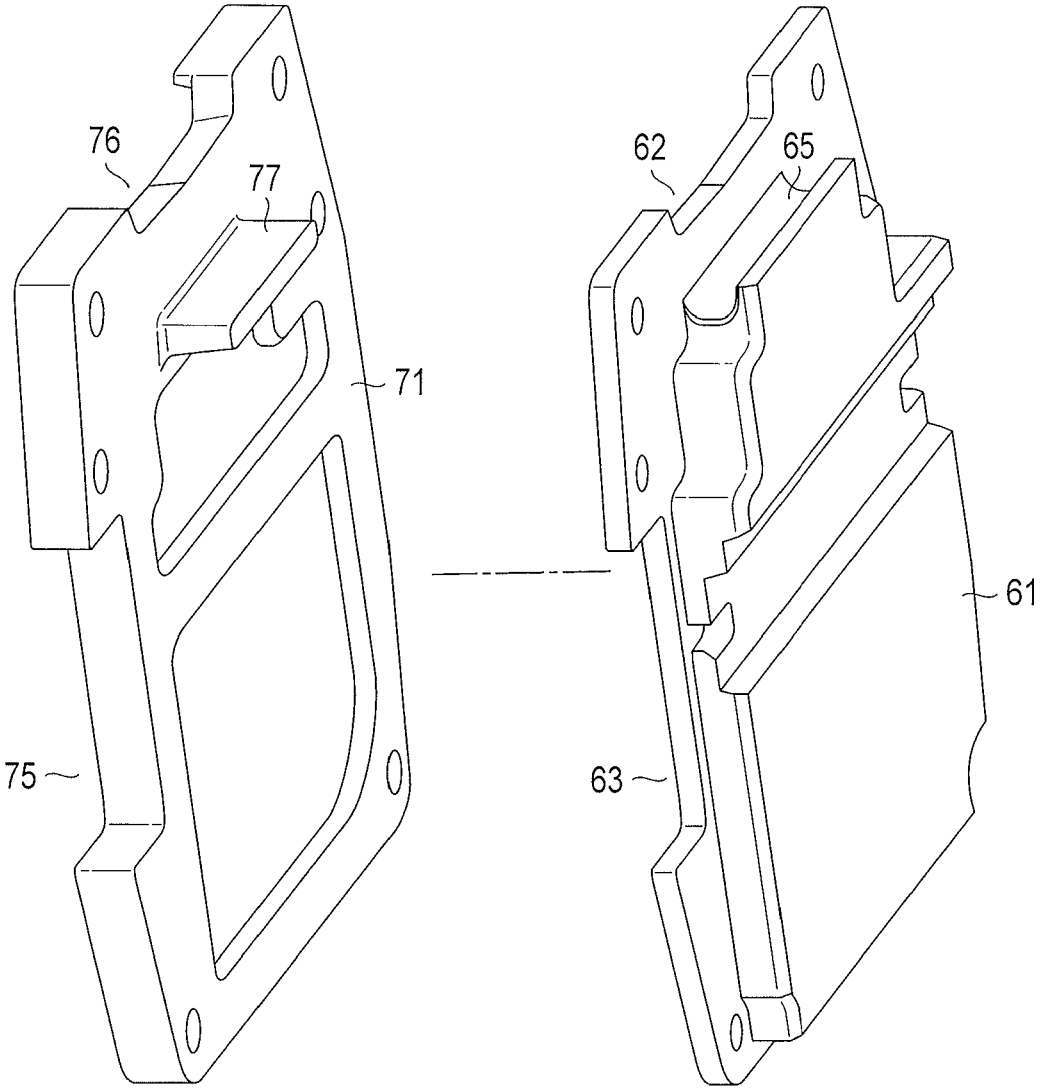

FIG. 7

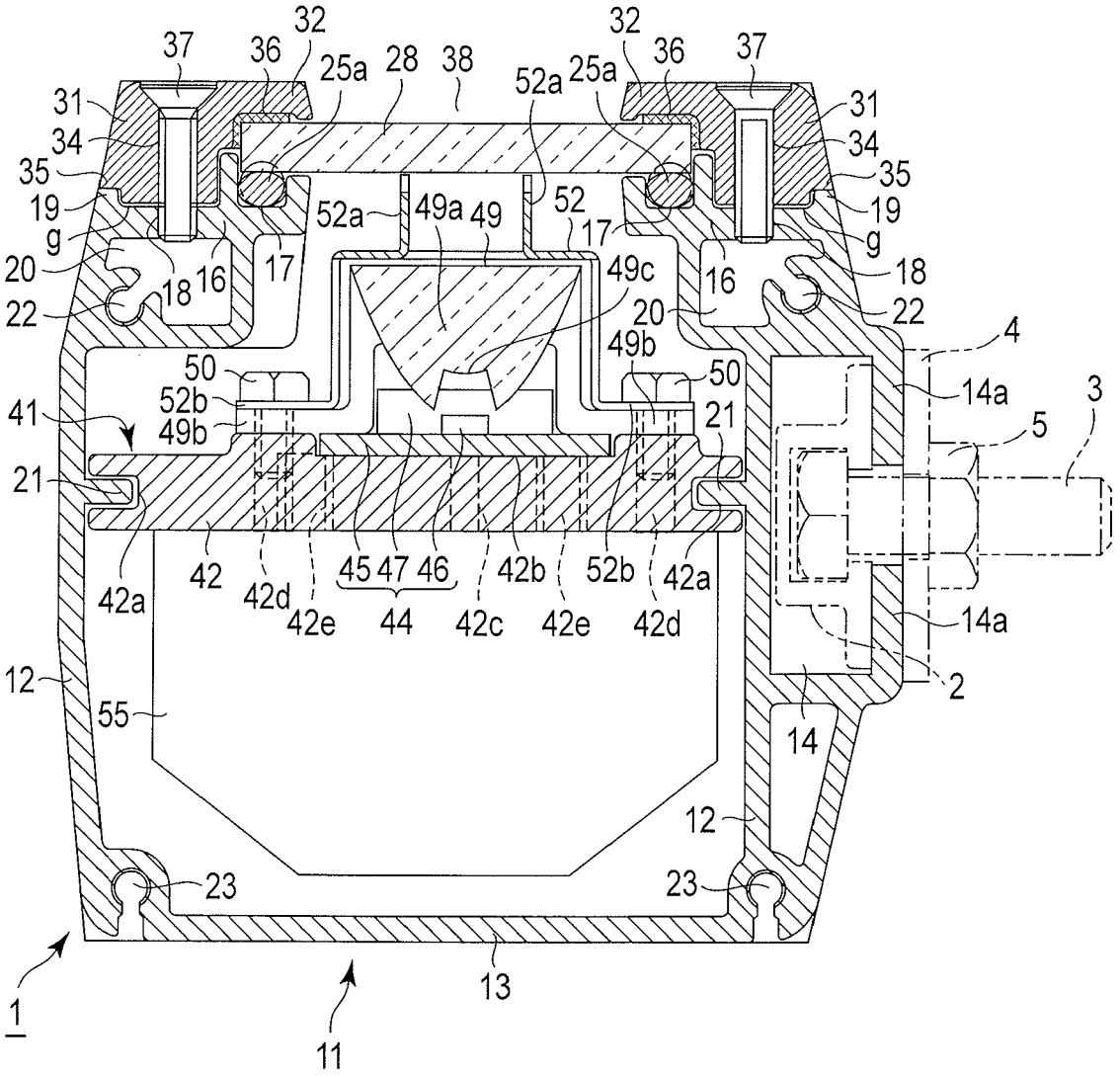
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FIG. 8

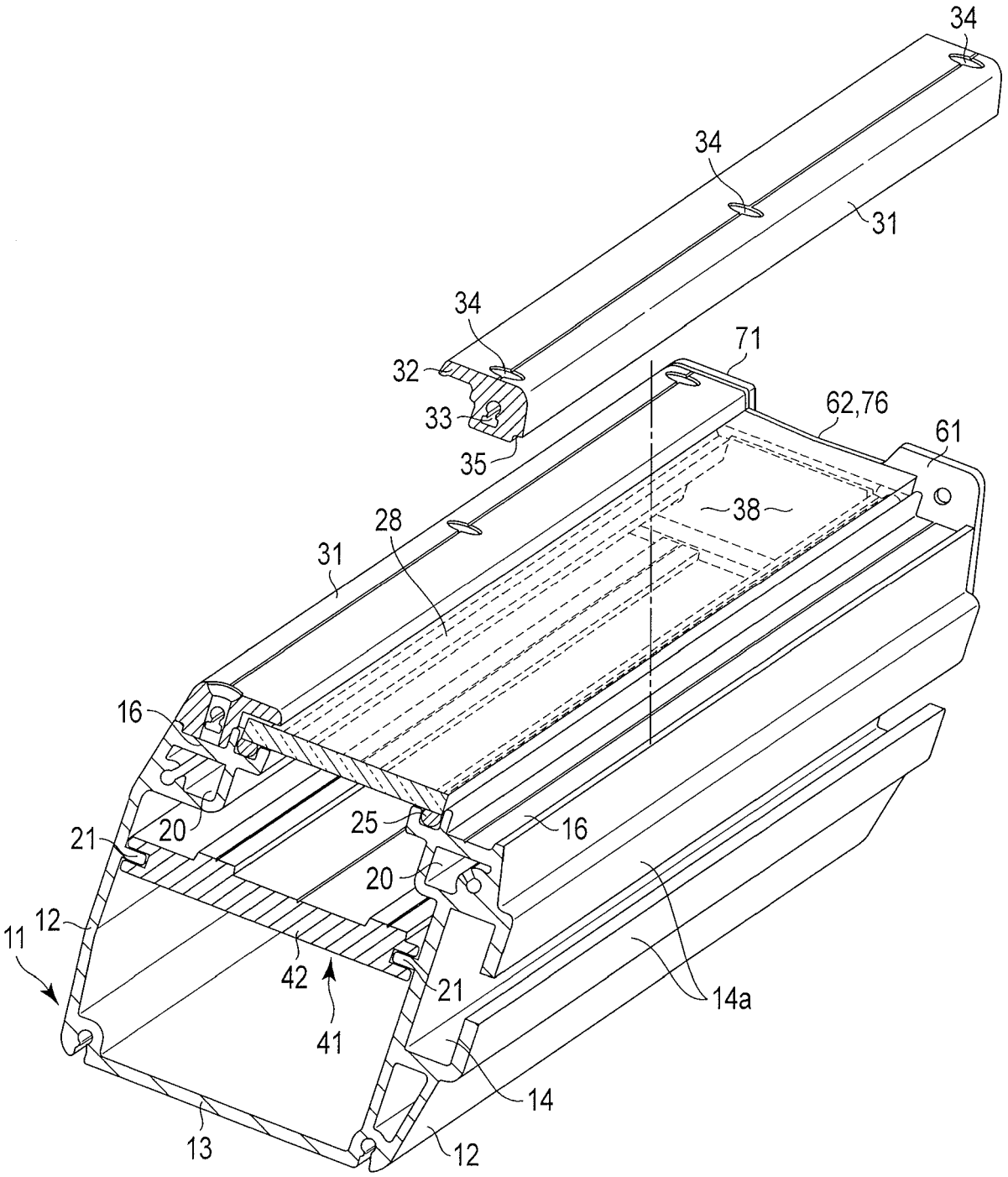
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FIG. 9

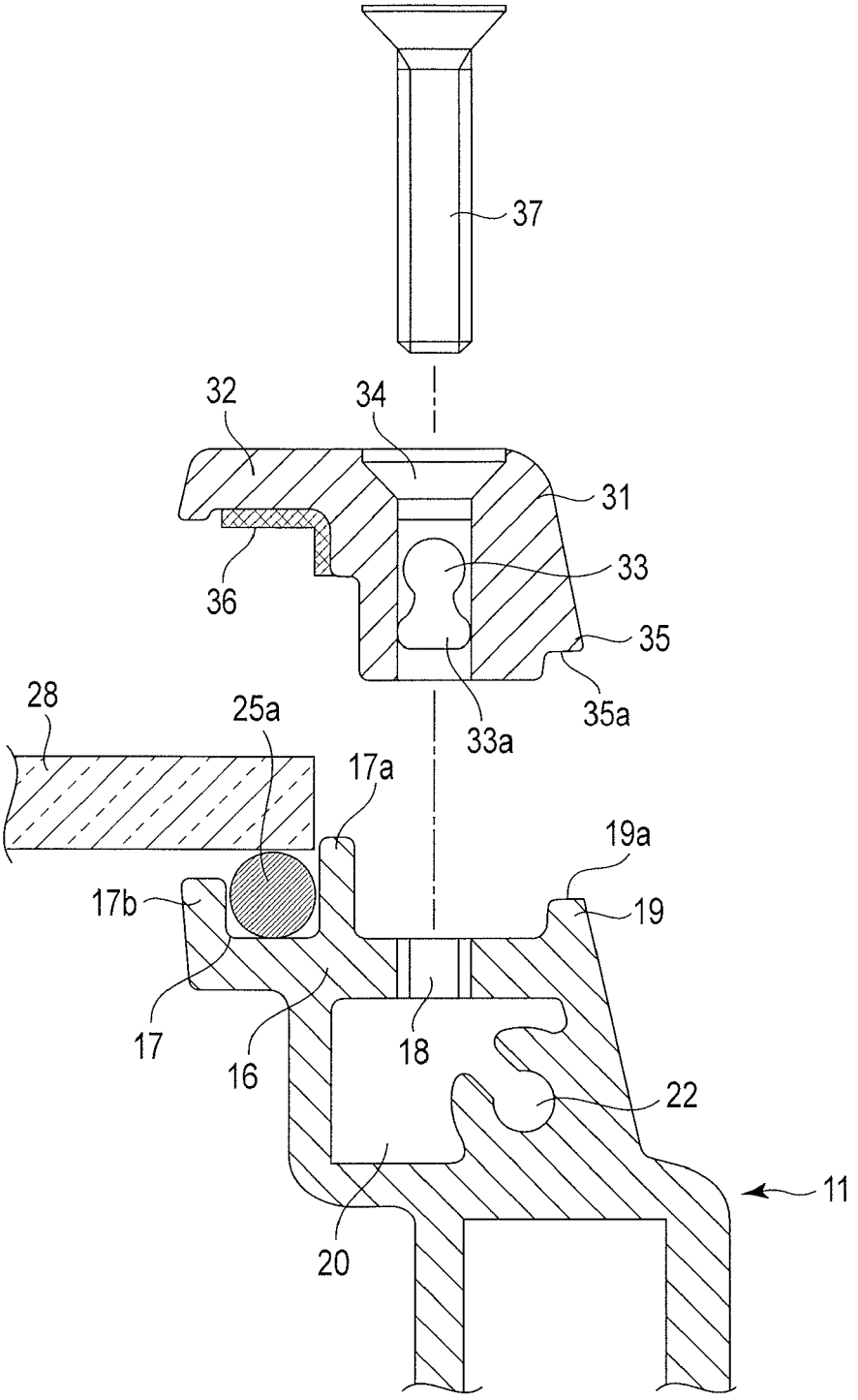

FIG. 10

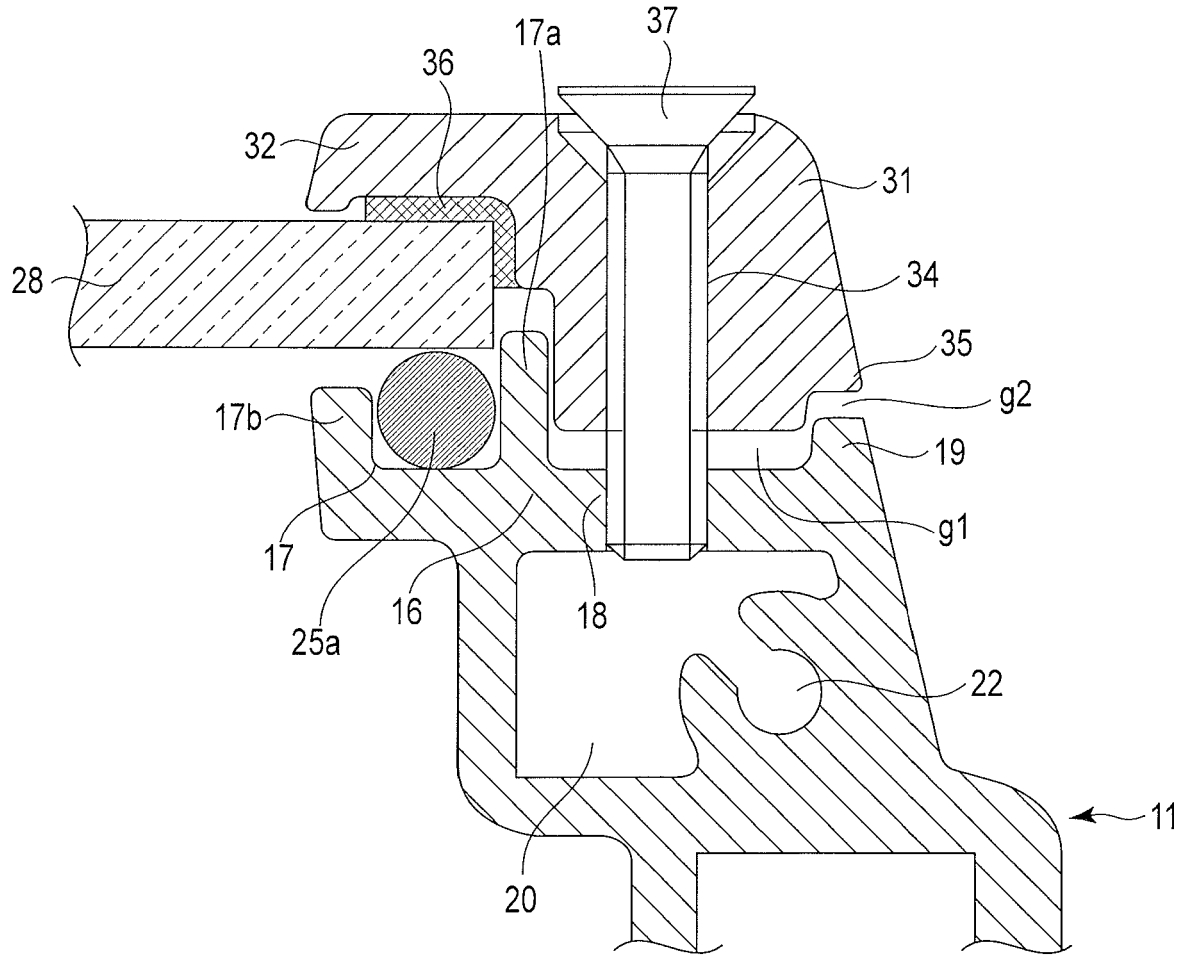

FIG. 11

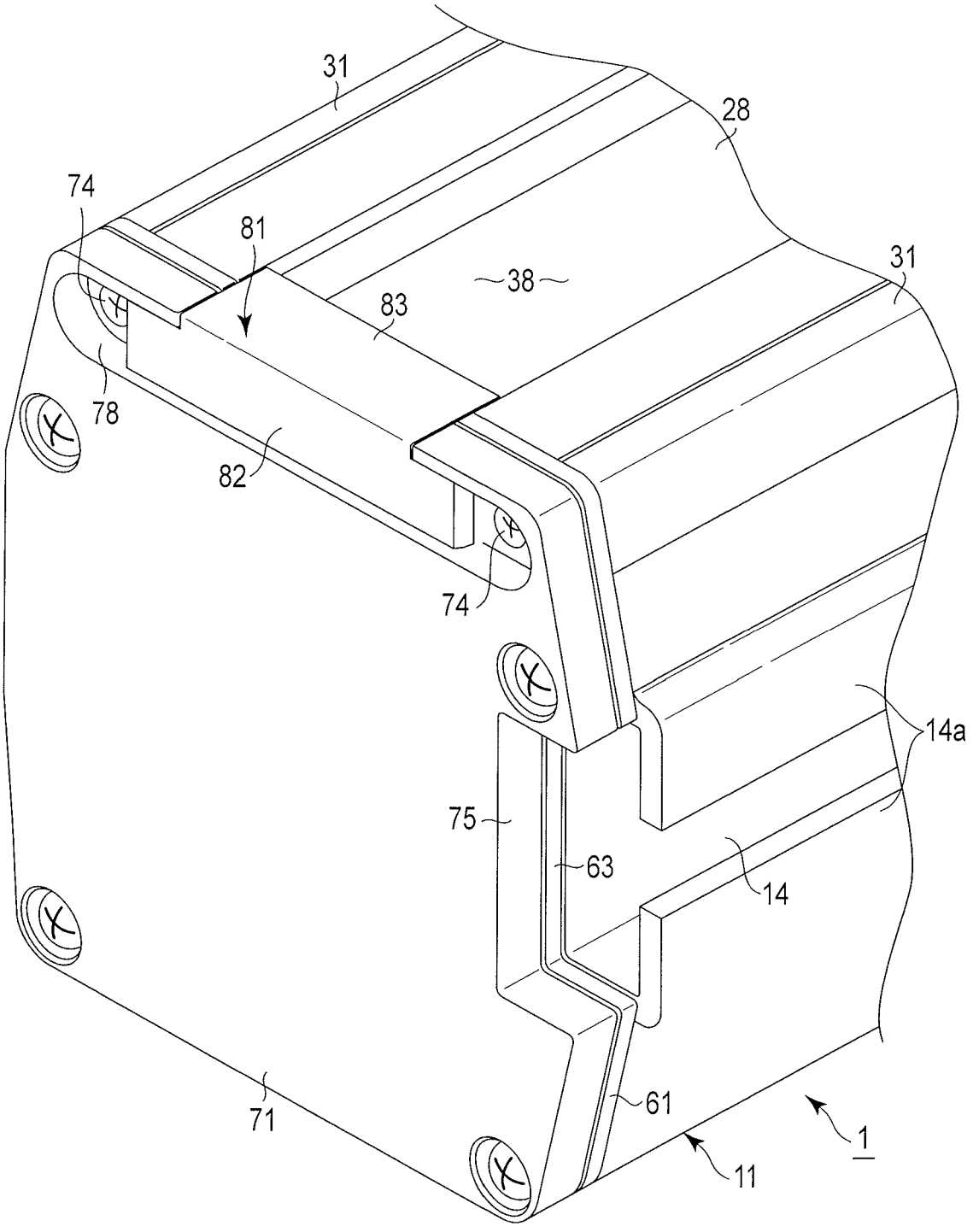

FIG. 12

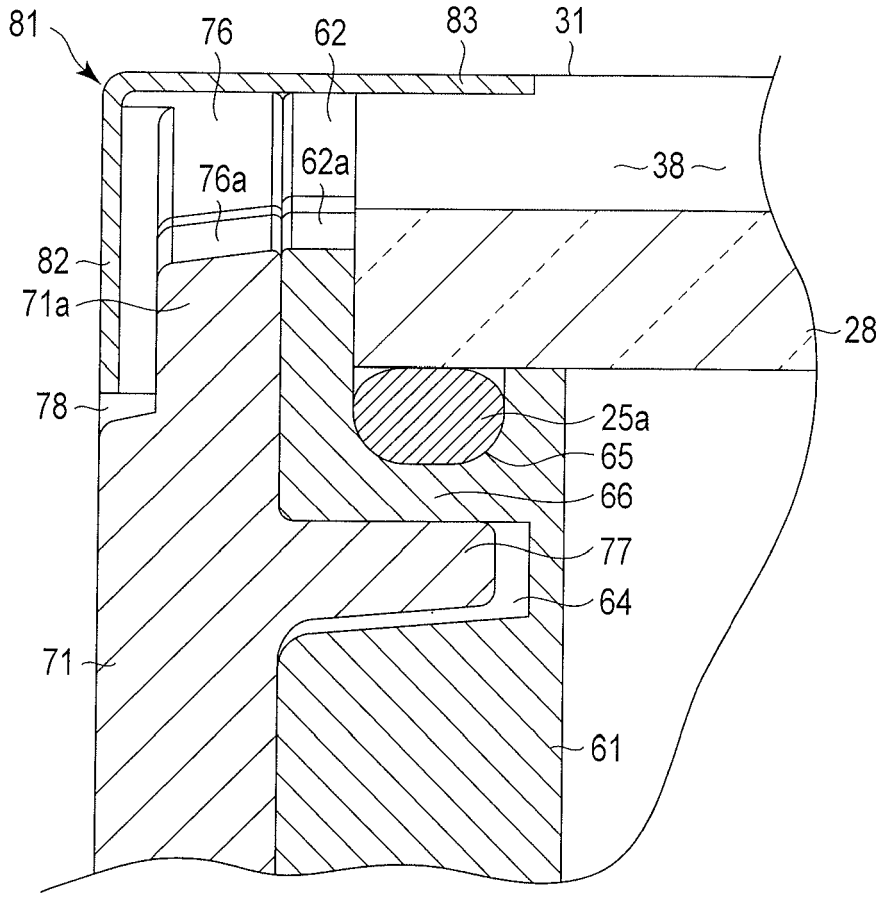

FIG. 13

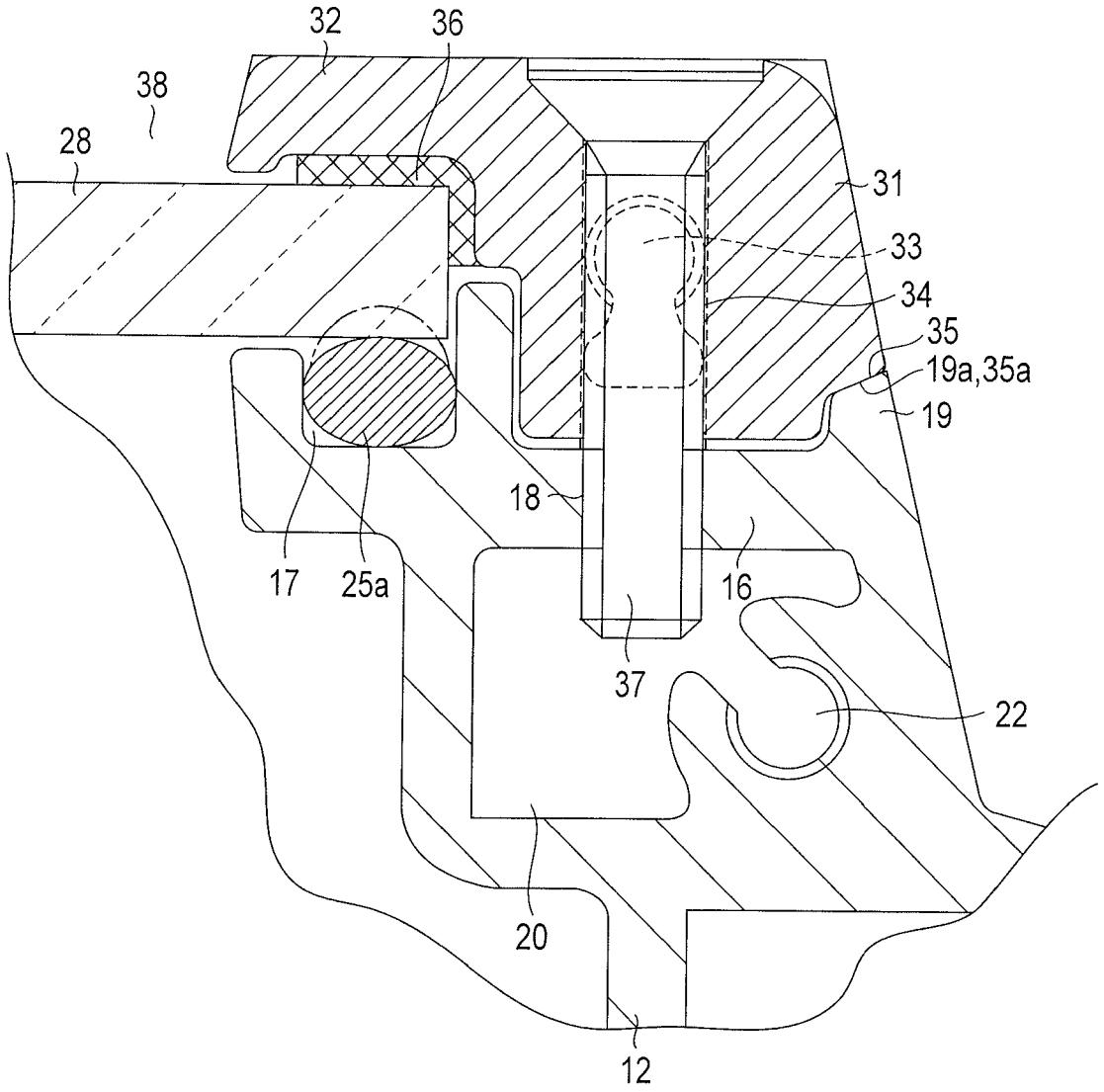

FIG. 14