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(71) Applicant: **iGUZZINI ILLUMINAZIONE S.p.A.**
62019 Recanati-Macerata (IT)

(72) Inventor: **Guzzini, Giannunzio**
62019, Recanati (Macerata) (IT)

(74) Representative: **De Gregori, Antonella et al**
Ing. Barzano' & Zanardo Milano S.p.A.
Via Borgonuovo 10
20121 Milano (IT)

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(54) **Lighting appliance with improved protection against water penetration in its interior**

(57) Lighting appliance with improved protection against water penetration in its interior comprising an outer casing (12, 112) in which there is at least one watertight lighting group (13, 113) in correspondence with at least

one opening (14, 114) situated in the casing (12, 112), a shield made of a transparent material (15, 115) being positioned in the at least one opening (14, 114), the casing (12, 112) envisaging housing elements (17, 19; 117, 119) of the watertight lighting group (13, 113).

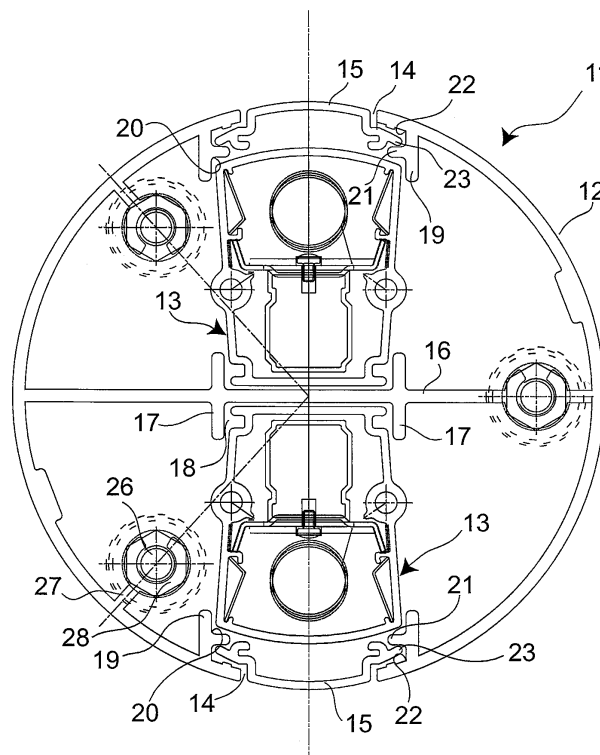


Fig. 3

Description

[0001] The present invention relates to a lighting appliance with improved protection against water penetration in its interior.

[0002] It is known that lighting appliances require differentiated protection degrees against water penetration in their interior according to the specific installation envisaged. External lighting appliances obviously require a high protection degree as they are exposed to atmospheric agents and any other possible attack from the outside.

[0003] For this purpose different solutions have been studied for providing protection against the entry of water, for example in column appliances, or so-called "bollards", and also for other types of watertight appliances.

[0004] One of these known solutions, for example, envisages a watertight seal on the outer casing, or between the glass cover of the light source and the casing itself, by inserting washers or similar elements or devices.

[0005] This solution, however, has coupling problems between the parts both for the formation of the watertight seal and also for the different behaviour of the materials (metallic casing - glass cover) with variations in the temperature, in particular with the extension differences.

[0006] Similar problems have also been verified in other solutions with respect to the coupling of the various elements forming the lighting appliance and the final structure which is particularly complex and aesthetically inappropriate.

[0007] An objective of the present invention is therefore to provide lighting appliances with improved protection against water penetration in their interior which solve the problems specified above.

[0008] A further objective of the present invention is to provide a lighting appliance with improved protection against water penetration in its interior which can be easily assembled, has a minimum number of component elements and does not require particular care in the coupling between the various parts.

[0009] Another objective of the present invention is to provide a lighting appliance with improved protection against water penetration in its interior which is particularly simple and functional, with reduced costs.

[0010] These objectives according to the present invention are achieved by providing a lighting appliance with improved protection against water penetration in its interior as specified in claim 1.

[0011] Further characteristics of a lighting appliance with improved protection against water penetration in its interior are object of the dependent claims.

[0012] The characteristics and advantages of a lighting appliance with improved protection against water penetration in its interior according to the present invention will appear more evident from the following illustrative and non-limiting description, referring to the enclosed schematic drawings, in which:

figure 1 is a raised longitudinal partial cross-section, of a first example of a lighting appliance with improved protection against water penetration in its interior according to the present invention with a circular section having a cylindrical shape,

figure 2 is a transversal section of the circular appliance of figure 1,

figure 3 is a transversal section of an appliance similar to that of figure 1, but equipped with two internal light groups and with double light emission,

figure 4 is a raised longitudinal partial cross-section of a second example of a lighting appliance with improved protection against water penetration in its interior according to the present invention with a rectangular section having a prismatic shape,

figure 5 is a transversal section of the appliance shown in figure 4,

figure 6 is a transversal section of an appliance similar to that of figure 5, but equipped with two internal light groups and double light emission,

figures 7a, 7b, 7c and 7d show sectional details of an appliance with a circular section with various accessories, and

figures 8a, 8b, 8c and 8d show sectional details of an appliance with a rectangular section with various accessories.

[0013] With reference to the figures, these show in both examples, using the same innovative concept of the present invention, a lighting appliance with improved protection against water penetration in its interior.

[0014] A lighting appliance with improved protection against water penetration in its interior comprises an outer casing 12 in which a watertight lighting group 13 is positioned. This arrangement is effected so that a watertight lighting group 13 is positioned in correspondence with an opening 14 situated in the casing 12, where there is a shield made of a transparent material 15.

[0015] Figures 1 and 2 show how in a first example, an appliance, indicated as a whole with 11, comprises an outer casing 12, having a cylindrical shape with a circular section, for example produced in a structural shape or extruded in aluminum or similar alloy. Said casing 12 has a longitudinal septum 16 in its interior, which divides the same casing in half in the direction of a diameter of the circular section. Along this septum 16 a pair of protuberances 17 are envisaged in an intermediate position, perpendicular to the septum 16, which define a seat 18 for the housing of a first end of the lighting group 13.

[0016] Almost analogously, on the internal surface of the cylindrical casing 12 there is a further pair of protuberances 19, facing and aligned with the previous protuberances 17, defining a further seat 20 for the housing of the opposite end of the lighting group 13. Furthermore, this further pair of protuberances 19 is positioned on opposite parts of the opening 14 and has appendices 21 which, in collaboration with sections of the internal surface of the casing 12, form opposite seats 22 for opposite

free ends 23 of the shield made of a transparent material 15.

[0017] A base element 24 and a covering or closing element 25 situated at opposite ends of the casing 12 can also be envisaged, the latter constrained by means of appropriate constraining elements 33 to the casing 12. The positioning of the casing 12 with respect to the ground is obtained by means of three tie-rods 26 which are housed in radial appendixes 27 situated on the inner surface of the casing 12.

[0018] More specifically, as shown in figure 2, these radial appendixes 27 have open C-ends 28 in which the tie-rods 26, nuts 29 and washers 30 are positioned. The base element 24 is constrained by means of further bolts 31, only one of which is shown, to a plate 32 immersed in or constrained to the ground.

[0019] Figure 3 shows in a transversal section only, how the cylindrical casing 12 can include two openings 14 situated, for example, on opposite sides. In this way, a pair of lighting groups 13 can be positioned inside the casing 12, situated in respective seats 18 and 20 identified by the pair of protuberances 17 and 19 produced by both sides of the central septum 16, which form housing elements of the lighting group. Two shields made of a transparent material 15 for the closing of the two openings 14, are also comprises. In order to facilitate this second alternative described above, the outer casing 12 can be specifically that also used for the single opening 14. In this case, in the position of the opening 14, the section of surface of the casing 12 is removable, for example by means of breakage draft lines present along corresponding generatrices of the side surface of the casing (not shown).

[0020] In the appliance of the invention, moreover, the watertight lighting group 13 can be produced by means of a polycarbonate extruded product with end stoppers and washers. The whole unit is preassembled, can be rapidly positioned in the respective housing and can have any suitable shape. It is even possible to use lighting groups of the standard type. The shield made of a transparent material 15 can also be made of polycarbonate, so as to be of the infrangible type and reasonably resistant. It can be produced however in a white opal, or coloured, semi-transparent or also "prismatic" version. The shield can also be made of another non-infrangible material, such as methacrylate.

[0021] The outer casing (not watertight) can be produced in various ways, it is even possible to couple an aluminum pole and a shield made of polycarbonate. In this way, a mechanically resistant product is obtained (infrangible shield) without jeopardizing the watertightness (the two materials have different elongations and therefore it would be extremely difficult to obtain watertightness between the two elements).

[0022] It should also be noted that the watertightness is completely independent of the form of the outer casing, which can be of various types (round, square, rectangular), and furthermore there can be one or more inner wa-

tertight lighting groups.

[0023] Figures 4, 5 and 6 show further examples of appliances according to the present invention in which similar elements are indicated with similar reference numbers preceded by the number "1".

[0024] It can therefore be noted that figures 4 and 5 show an appliance, indicated as a whole with 111, comprises an outer casing 112, having a prismatic form with a rectangular section, for example produced in a structural shape made of aluminum or similar alloy.

[0025] The casing 112 has a pair of longitudinal septa 116 in its interior, which divide the casing itself into three portions in a direction perpendicular to the outer sides having a greater dimension. Protuberances 117 are included along these septa 116, arranged perpendicular to the septum 116, which define a seat 118 for the housing of a first end of the lighting group 113. Furthermore, on the outer surface of the casing 112, there is at least one opening 114 which envisages a further pair of protuberances 119, facing the previous protuberances 117, forming a further seat 120 for the housing of the opposite end of the lighting group 113. This further pair of protuberances 119, moreover, is situated at opposite sides of the opening 114 and has appendixes 121 which, in collaboration with sections of the internal surface of the casing 12 or further protuberances 134, form opposite seats 122 for opposite free ends 123 of the shield made of a transparent material 115.

[0026] A base element 124 and a covering or closing element 125 situated at opposite ends of the casing 112 can also be included. The positioning of the casing 112 with respect to the ground is obtained by means of three tie-rods 126 which are housed in radial appendixes 127, forming part of the septa 116 situated on the inner surface of the casing 112. More specifically, as shown in figure 5, these portions 127 have open C-ends 128 in which the tie-rods 126, nuts and washers (not shown) are positioned. The base element 124 is constrained by means of further bolts, schematized in 131, only one of which is shown, to a plate 132 immersed in or constrained to the ground.

[0027] Figure 6 shows in a transversal section only, how the prismatic casing 112 can include two openings 114 situated, for example, on opposite sides. In this way, a pair of lighting groups 113 can be positioned inside the casing 112, situated in respective seats 118 and 120 identified by the pair of protuberances 117 and 119 produced by both sides of the central septa 116. Two shields made of a transparent material 115 for the closing of the two openings 114, are also envisaged. In order to facilitate this second alternative described above, the outer casing 112 can be specifically that also used for the single opening 114. In this case, in the position of the opening 114, the section of surface of the casing 112 is removable, for example by means of breakage draft lines present along corresponding generatrices of the side surface of the casing (not shown).

[0028] It is also interesting to note how, according to

the invention, the appliance, comprising at least one shield made of a particular transparent material 15, 115 allows a series of accessories to be assembled, such as a lightbreaker (for limiting any possibility of dazzling), coloured filters (to have a coloured light), etc.

[0029] Figures 7a, 7b, 7c and 7d show some of these lighting appliances with a circular section. It can in fact be noted that the shield 15 has hollow seats 35 for receiving a colour filter 39 (figure 7a), or lightbreaker filters 36 with longitudinal flaps 37 (figure 7b), and lightbreaker filters 40 with transversal flaps 38 (figures 7c and 7d).

[0030] Figures 8a, 8b, 8c and 8d show some of these lighting appliances with a rectangular section. It can in fact be noted that the shield 115 has hollow seats 135 for receiving a colour filter 139 (figure 8a), or lightbreaker filters 136 with longitudinal flaps 137 (figure 8b), and lightbreaker filters 140 with transversal flaps 138 (figures 8c and 8d). Numerous advantages are therefore obtained thanks to this advantageous arrangement.

[0031] The drawbacks of the known art are consequently overcome and a particularly advantageous lighting appliance is provided which is simple to construct and assemble.

[0032] A lighting appliance with improved protection against water penetration in its interior according to the present invention thus conceived can undergo numerous modifications and variations, all included in the present invention; furthermore, all the details can be substituted by technically equivalent elements. In practice the materials used as also the dimensions can vary according to the technical demands.

Claims

1. A lighting appliance with improved protection against water penetration in its interior comprising an outer casing (12, 112) in which there is at least one watertight lighting group (13, 113) in correspondence with at least one opening (14, 114) situated in the casing (12, 112), a shield made of a transparent material (15, 115) being positioned in the at least one opening (14, 114), said casing (12, 112) comprising housing elements (17, 19; 117, 119) of said watertight lighting group (13, 113).
2. The lighting appliance according to claim 1, **characterized in that** said outer casing (12, 112) includes at least one inner septum (16, 116) having at least some of said housing elements (17, 19; 117, 119) of said watertight lighting group (13, 113) in the form of protuberances (17, 117).
3. The lighting appliance according to claim 1, **characterized in that** on the inner surface of said outer casing (12, 112) at said at least one opening (14, 114) there are protuberances (19, 119) on opposite sides thereof, defining said housing elements.

4. The lighting appliance according to claim 3, **characterized in that** said protuberances (19, 119) also have appendixes (21, 121) which, in collaboration with said casing (12, 112) define seats (22, 122) for opposite ends of said shield made of a transparent material (15, 115).
5. The lighting appliance according to claims 2 and 3, **characterized in that** said protuberances (17, 19; 117, 119) define, in collaboration with their seats (18, 118; 20, 120) fins for said at least one watertight lighting group (13, 113).
6. The lighting appliance according to claim 1, **characterized in that** said outer casing (12, 112) has on one of its inner surfaces, appendixes or portions (27, 127) for receiving tie-rods (26, 126) for fixing to the ground.
7. The lighting appliance according to claim 6, **characterized in that** said appendixes or portions (27, 127) have open C-ends (28, 128) in which said tie-rods (26, 126) are positioned.
8. The lighting appliance according to claim 1, **characterized in that** said outer casing (12, 112) is produced in a structural shape or extruded in aluminum or similar alloy.
9. The lighting appliance according to claim 1, **characterized in that** said shield made of a transparent material (15, 115) is made of polycarbonate or methacrylate.
10. The lighting appliance according to claim 1, **characterized in that** said watertight lighting group (13, 113) is produced by means of a polycarbonate extruded product with end stoppers and washers.
11. The lighting appliance according to claim 1, **characterized in that** said shield made of a transparent material (15, 115) has hollow seats (35, 135) for receiving various types of accessories.
12. The lighting appliance according to claim 11, **characterized in that** said accessories of said shield made of a transparent material (15, 115) comprise a colour filter (39, 139), or lightbreaker filters (36, 136) with longitudinal flaps (37, 137), and lightbreaker filters (40, 140) with transversal flaps (38, 138).

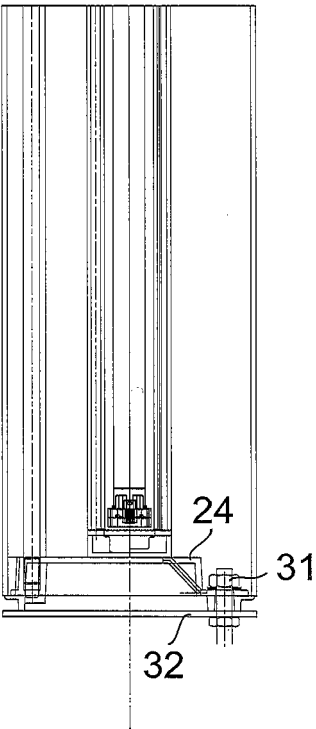
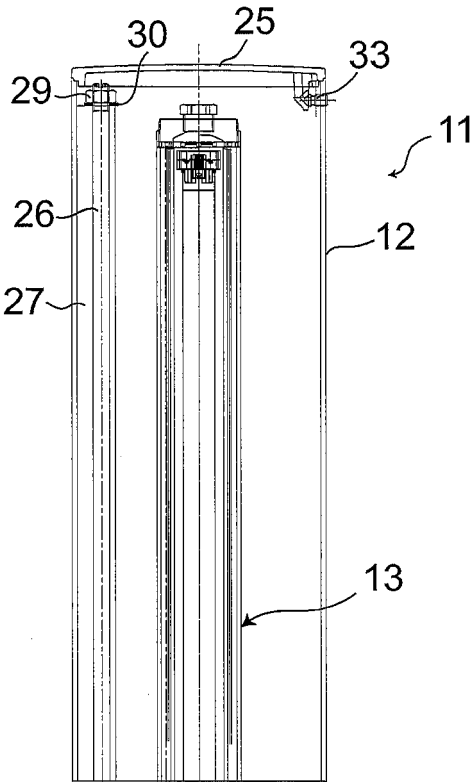


Fig. 1

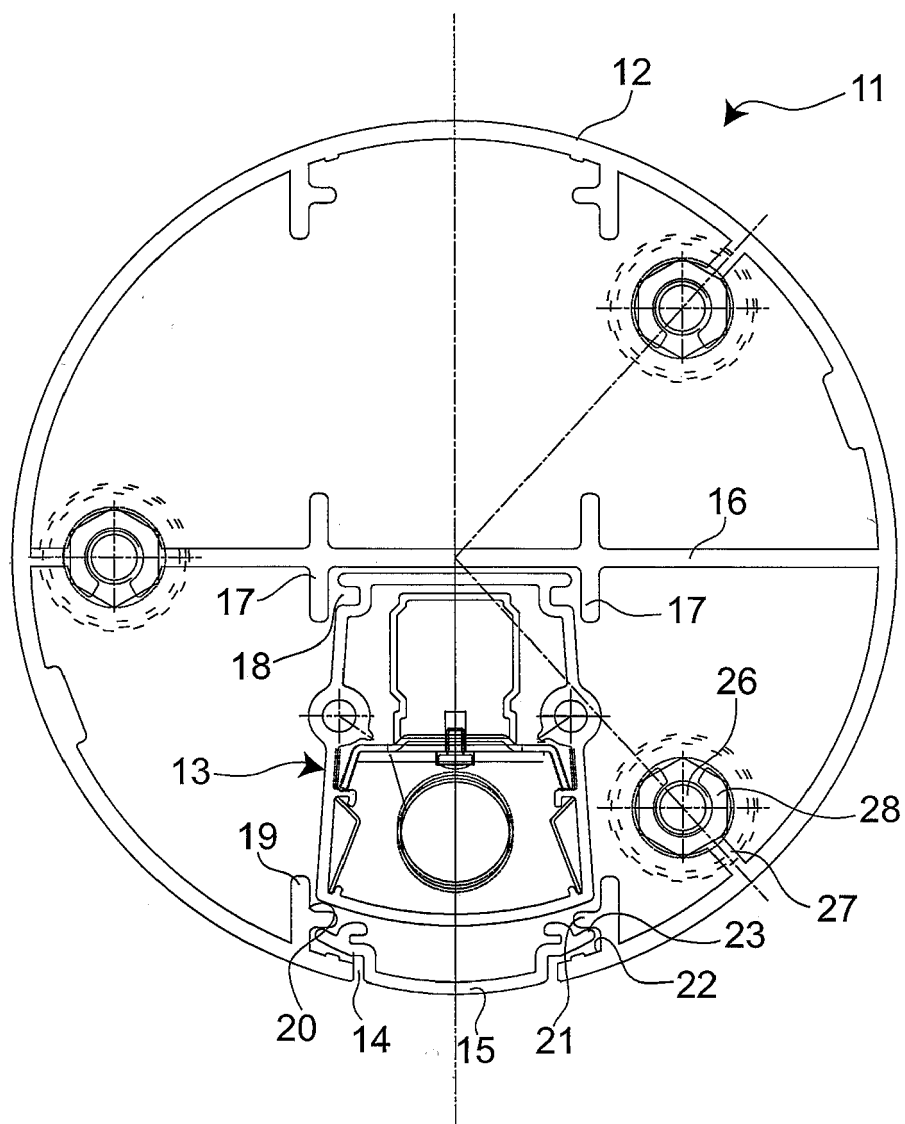


Fig. 2

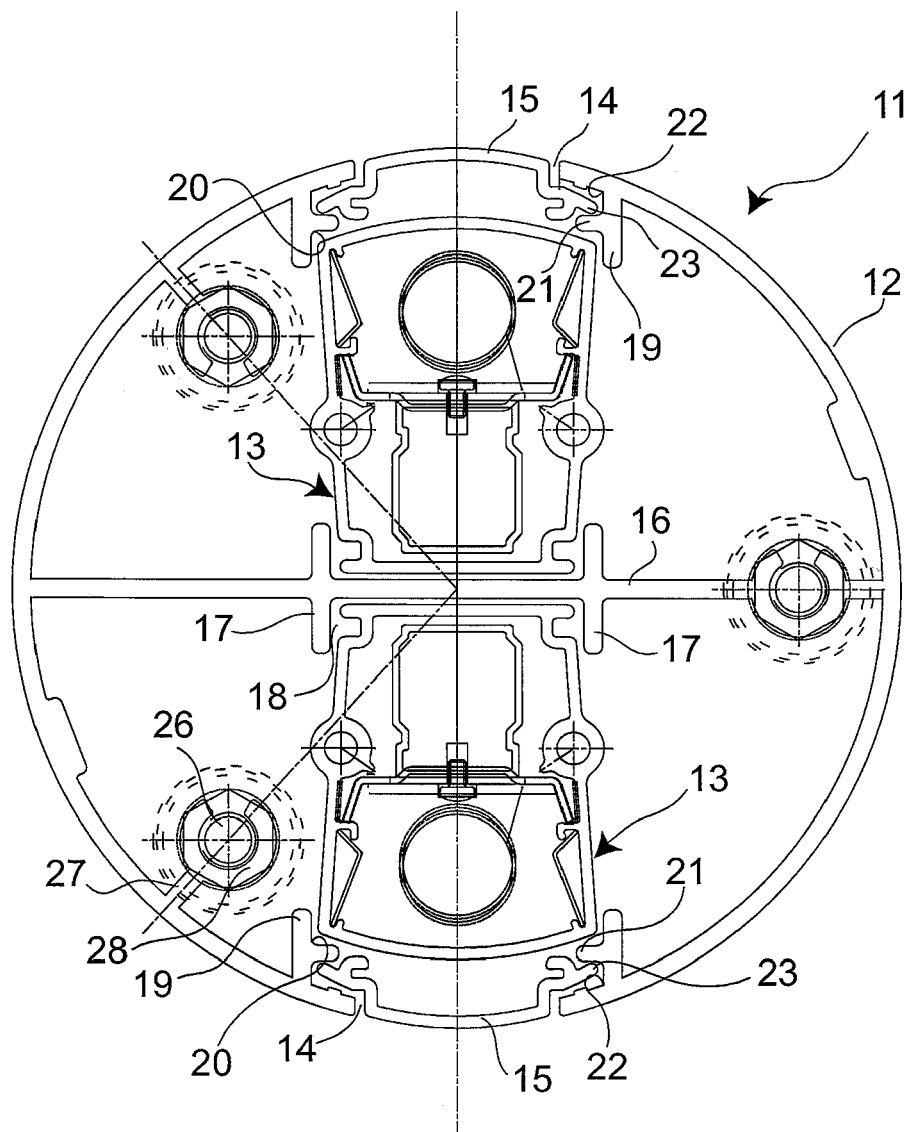


Fig. 3

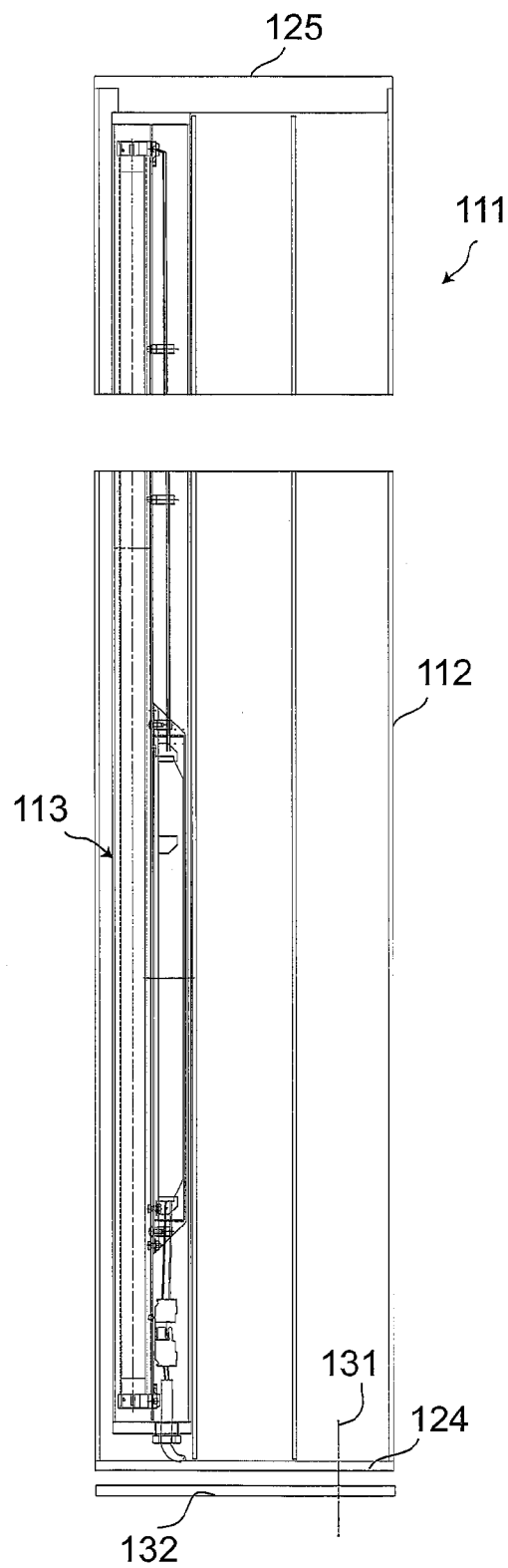


Fig. 4

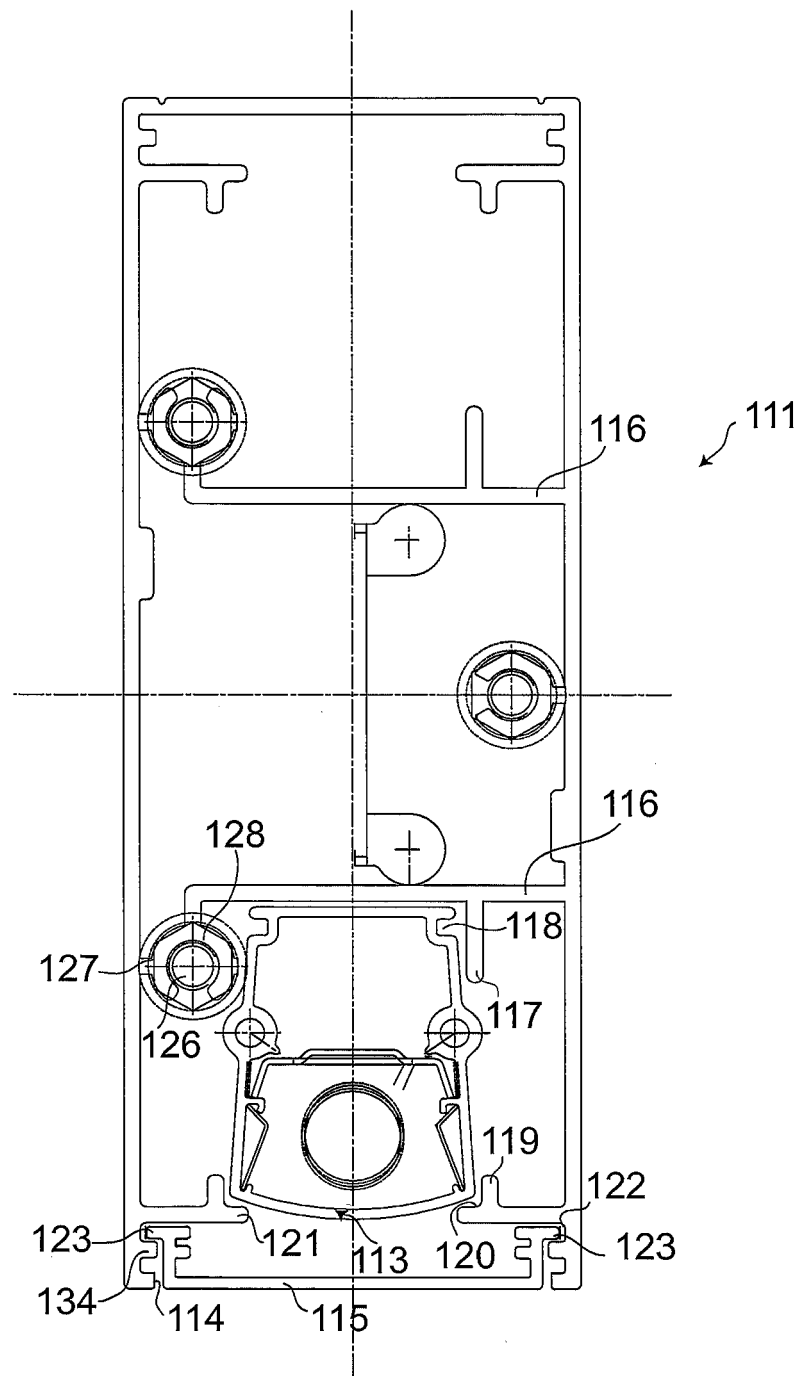


Fig. 5

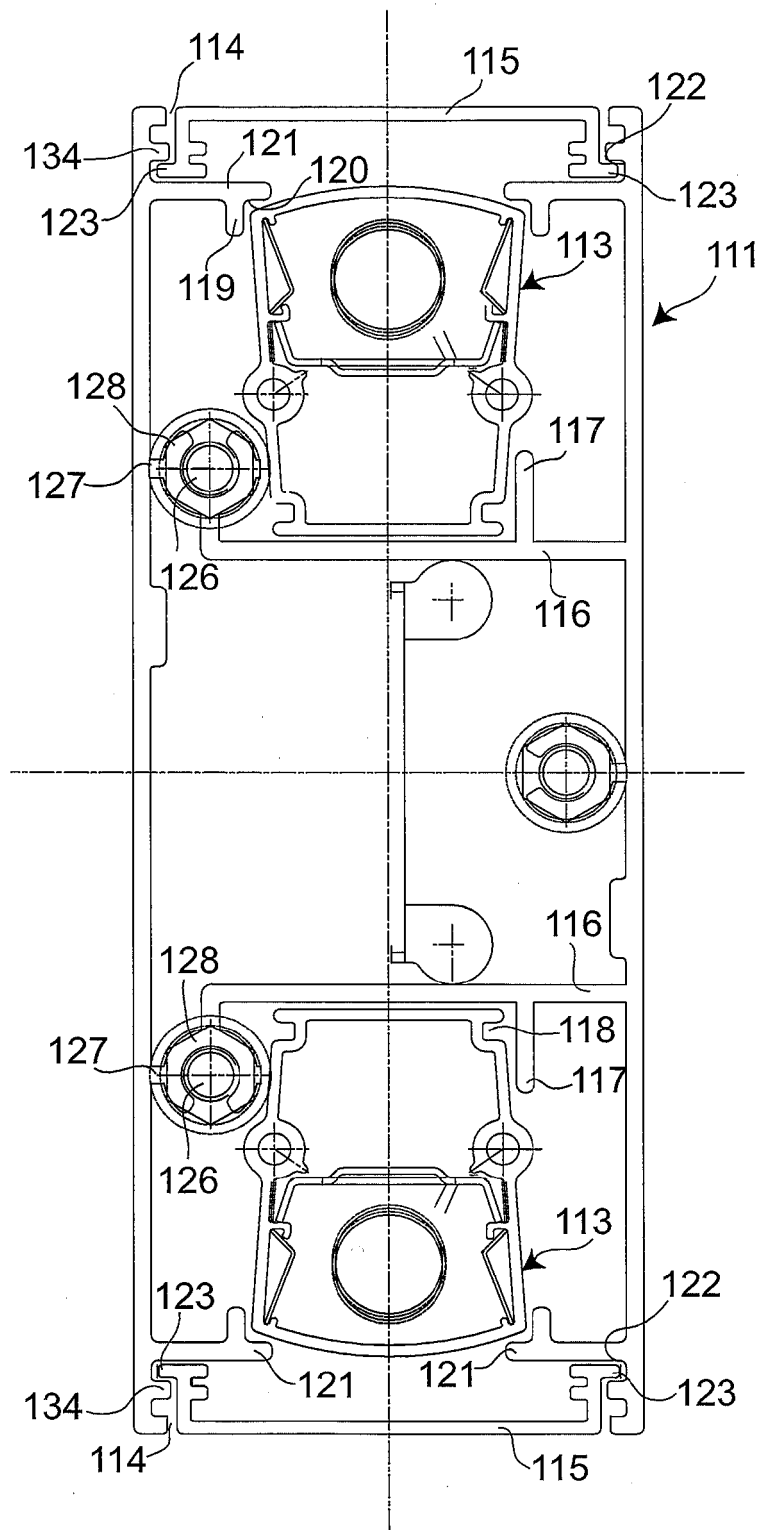


Fig. 6

Fig. 7a

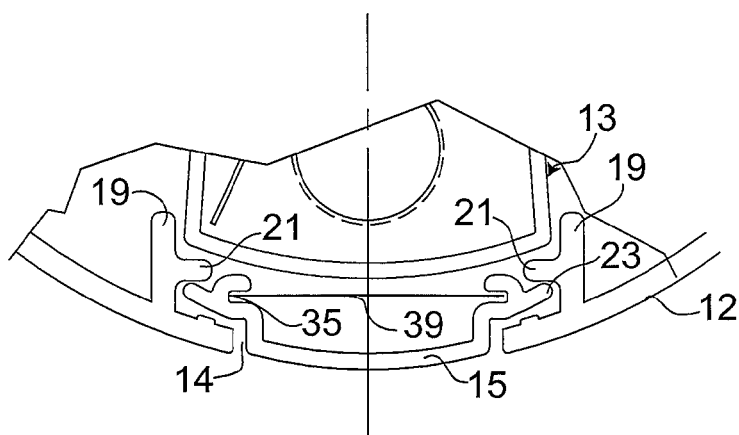


Fig. 7b

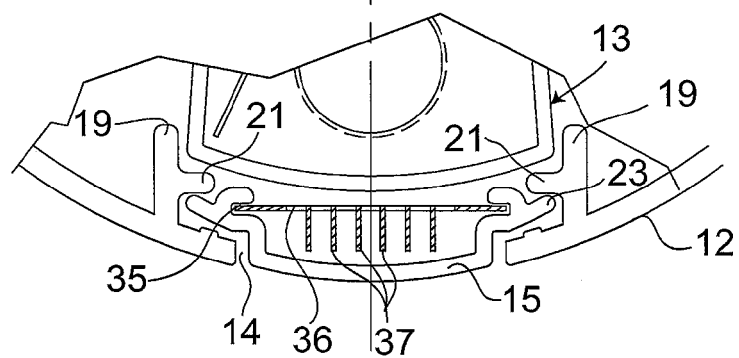


Fig. 7c

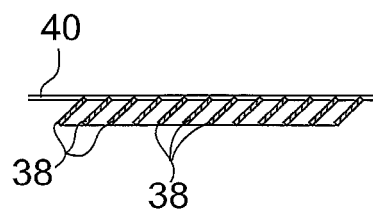
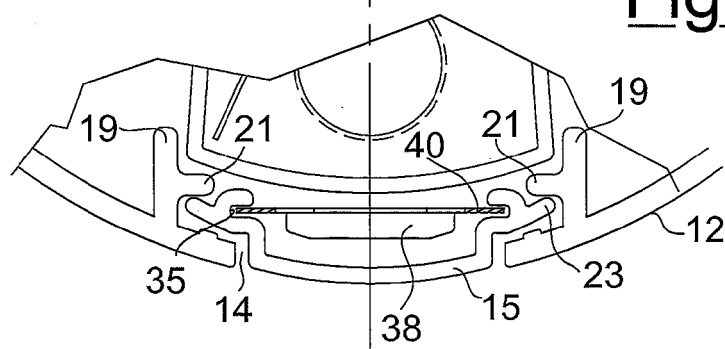


Fig. 7d

Fig. 8a

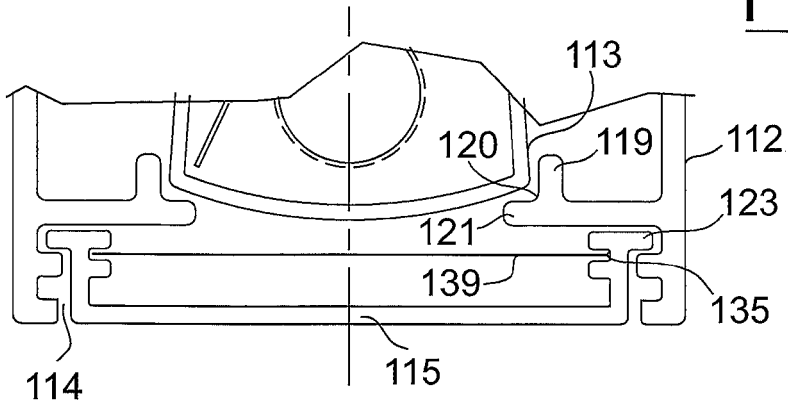


Fig. 8b

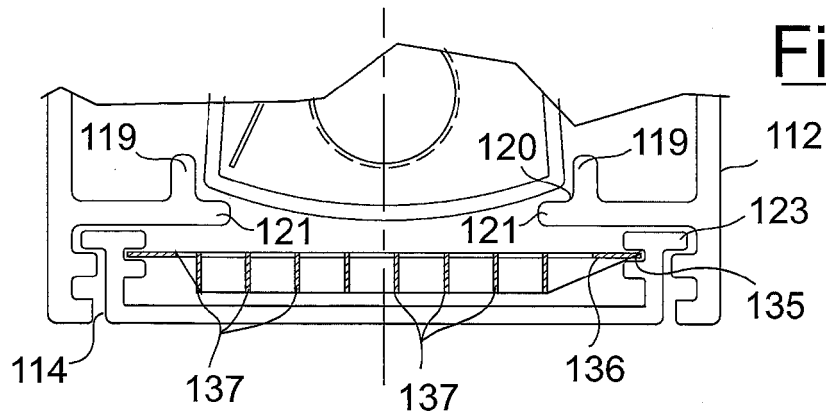


Fig. 8c

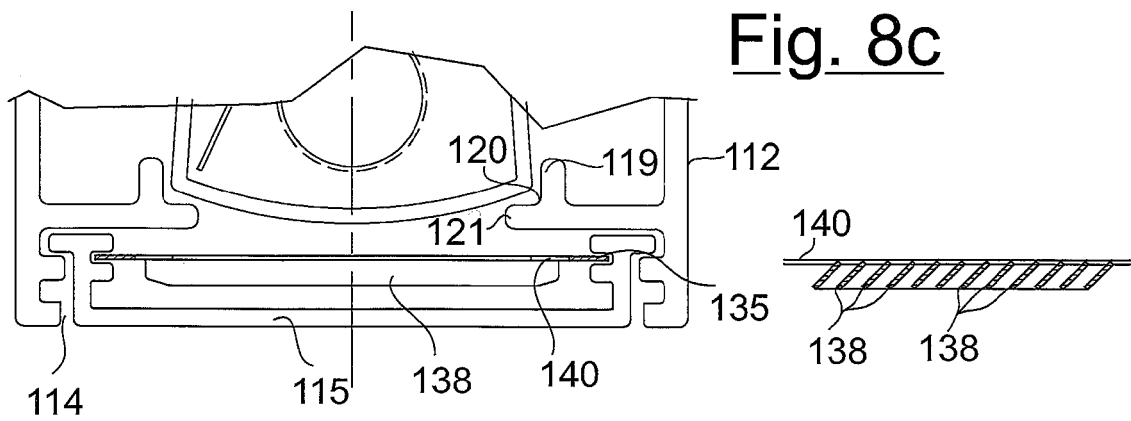


Fig. 8d