



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.06.2015 Bulletin 2015/23

(51) Int Cl.:
F25D 29/00 (2006.01)

(21) Application number: **14193773.0**

(22) Date of filing: **19.11.2014**

(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

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(30) Priority: **29.11.2013 CN 201320778095 U**

(54) **Refrigeration appliance**

(57) The present invention relates to a refrigeration appliance. The refrigeration appliance includes an accommodating housing (1) with an accommodating cavity (10) having an open end, at least one electrical component (3) disposed in the accommodating housing (1), and a cover (2) for sealing the accommodating cavity (10), the accommodating housing (1) having a first side (141) and a second side (142) opposite to each other. According to the present invention, the refrigeration appliance further includes a seal ring (4) between the cover (2) and the accommodating housing (1), one of the cover (2) and

the first side (141) of the accommodating housing (1) is provided with a slot (171, 172), the other of the cover (2) and the accommodating housing (1) is provided with an insert portion (211) for being inserted into the slot (171, 172), an angle is formed between a direction in which the insert portion (211) is inserted into the slot (171, 172) and a central axis (A) of the accommodating housing (1), the second side (142) is connected to the cover (2) by at least one fixing mechanism, and the fixing mechanism makes the cover (2) press the seal ring (4) in a direction towards the accommodating housing (1).

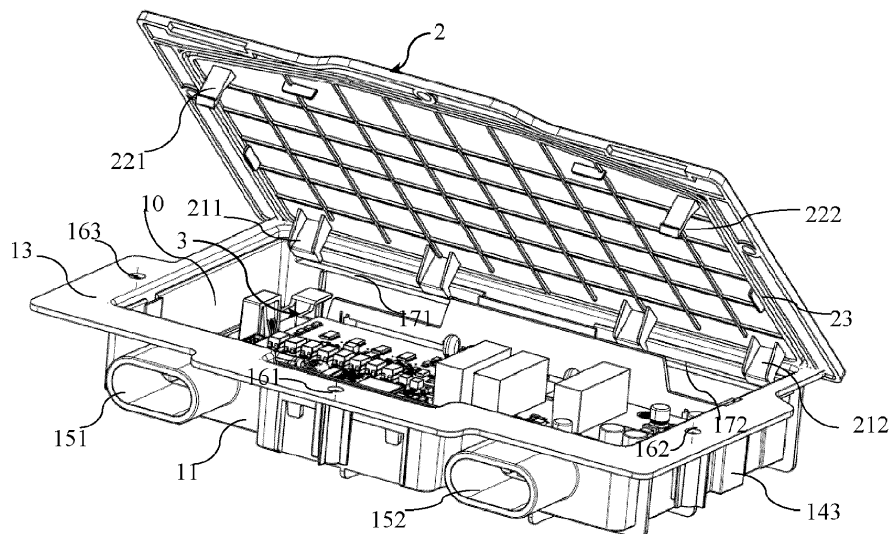


FIG. 2

Description

BACKGROUND

Technical Field

[0001] The present invention relates to a refrigeration appliance, and in particular, to a household refrigeration appliance, for example, a refrigerator or a wine cooler.

Related Art

[0002] A refrigeration appliance, for example a refrigerator or a wine cooler, is usually provided with at least one electrical component, for example, a circuit board. During design of the refrigeration appliance, preventing liquid from entering an accommodating cavity that accommodates the electrical component and contacting the electrical component is one of the considerations. When the accommodating housing needs to be sealed by a cover exposed to the outer surface of the refrigeration appliance, the problem becomes especially notable.

SUMMARY

[0003] An objective of the present invention is to provide a refrigeration appliance, which helps to improve the safety of an electrical component without significantly reducing the cost efficiency.

[0004] The objective can be achieved by characteristics of independent claims. Preferred embodiments of the present invention are subject matters of the accompanying drawings, specification and dependent claims.

[0005] An aspect of the present invention relates to a refrigeration appliance. The refrigeration appliance includes an accommodating housing with an accommodating cavity having an open end, at least one electrical component disposed in the accommodating housing, and a cover for sealing the accommodating cavity, the accommodating housing having a first side and a second side opposite to each other, characterized in that the refrigeration appliance further includes a seal ring disposed between the cover and the accommodating housing, one of the cover and the first side of the accommodating housing is provided with a slot, the other of the cover and the accommodating housing is provided with an insert portion for being inserted into the slot, an angle is formed between a direction in which the insert portion is inserted into the slot and a central axis of the accommodating housing, the second side is connected to the cover by at least one fixing mechanism, and the fixing mechanism makes the cover press the seal ring in a direction towards the accommodating housing.

[0006] In one aspect, the pressed seal ring between the cover and the accommodating housing can prevent liquid from entering an accommodating cavity. In another aspect, through insertion and connection between the cover and the first side of the accommodating housing

in a direction not parallel to the central axis of the accommodating housing and by using a fixing mechanism that makes the cover press the seal ring, the cover and the seal ring are fixed. In this way, the cover and the accommodating housing are reliably fixed and the seal ring deforms. In addition, because the insert portion is inserted into the slot at an angle that is not parallel to the central axis of the accommodating housing, after the second side is fixed, the first side can be fixed through the limit function of the insert portion and the slot as well, which also helps to reduce the number of fixing mechanisms and makes it easy to fix the cover to the accommodating housing.

[0007] The refrigeration appliance may be a household refrigeration appliance with a cooled heat insulation storage compartment, for example, a refrigerator or a wine cooler. The accommodating housing may, for example, be embedded in a heat insulation layer, and the cover may, for example, be exposed to the outer surface of the refrigeration appliance or disposed inside the refrigeration appliance. The accommodating housing may, for example, be disposed at the top or at the rear of the refrigeration appliance.

[0008] The electrical component may be any component that can work after being connected to power, for example, an electrical component such as a circuit board, a cable, a resistor, a capacitor, a relay and/or a combination thereof.

[0009] The fixing mechanism can fix the cover to the accommodating housing, and make the cover press the seal ring, and may be, for example, a screw thread connection mechanism fixing the cover to the accommodating housing and/or a buckling connection mechanism for the cover and the accommodating housing.

[0010] Other independent characteristics or those characteristics that are considered as features of the present invention through combination with other characteristics will be described in the following appended claims.

[0011] In a possible embodiment, the insert portion is connected to the slot between the seal ring and a bottom wall of the accommodating housing in a depth direction of the accommodating cavity. This helps to ensure the effect of the seal ring.

[0012] In a possible embodiment, an extension portion extending towards the bottom wall of the accommodating housing for being connected to the first side in an inserting-receiving way is provided on the inner side of the cover, and the extension portion is connected to an area of the cover that is located within the seal ring. This further helps to ensure the effect of the seal ring.

[0013] Though it is possible to form the insert portion on the cover, in a possible embodiment, an end of the extension portion forms the insert portion extending towards the first side, and this especially helps to reduce space occupied by the insert structure in the accommodating cavity.

[0014] In a possible embodiment, the extension portion has an approximately L-shaped section.

[0015] In a possible embodiment, at least two of the insert portions arranged at an interval are inserted into the slot, and each insert portion adjoins a corresponding end surface of the slot.

[0016] In a possible embodiment, the slot and/or the insert portion is at least approximately parallel to the cover. Thus, a more reliable limit relation in the depth direction of the accommodating cavity can be formed between the slot and the insert portion.

[0017] In a possible embodiment, the insert portion and/or the slot is provided with a wedge-shaped guide structure. Thus, it is easier to insert the insert portion into the slot.

[0018] In a possible embodiment, the slot is dented outwards from a wall of the first side. This helps to reduce space occupied by the slot and the insert portion in the accommodating cavity.

[0019] In a possible embodiment, the present invention includes multiple of the fixing mechanisms.

[0020] In a possible embodiment, at least one of the fixing mechanisms includes a screw penetrating the cover and connected to the accommodating housing.

[0021] In a possible embodiment, at least one of the fixing mechanisms includes a buckling structure for buckling the cover and the accommodating housing

[0022] In a possible embodiment, the buckling structure includes an elastic hook extending towards the bottom wall of the accommodating housing from the inner side of the cover, and the elastic hook is connected to an area of the cover that is located within the seal ring.

[0023] In a possible embodiment, the accommodating housing is provided with at least one cable hole penetrating the wall of the accommodating housing, and the cable hole is located in the second side.

[0024] The structure of the present invention and other inventive objectives and beneficial effects of the present invention become more comprehensible through the description of preferred embodiments with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] As a part of this specification and for further understanding of the present invention, the following accompanying drawings describe specific implementation manners of the present invention, and are used to describe the principle of the present invention together with the specification.

FIG. 1 is a schematic three-dimensional diagram of an electrical component installation assembly of a refrigeration appliance according to a preferred embodiment of the present invention;

FIG. 2 is a schematic three-dimensional diagram illustrating a cover detached from a side of an accommodating housing according to a preferred embodiment of the present invention;

FIG. 3 is a three-dimensional exploded view of an electrical component installation assembly according to a preferred embodiment of the present invention; and

FIG. 4 is a schematic cross-sectional view along the direction of I-I in FIG. 1.

DETAILED DESCRIPTION

[0026] Referring to FIGs. 1-4, an electrical component installation assembly 100 applicable to a refrigeration appliance (not shown) includes an accommodating housing 1 fixed to the refrigeration appliance. The accommodating housing 1 may, for example, be connected to a shell of the refrigeration appliance and be closely combined with a heat insulation layer of the refrigeration appliance.

[0027] The accommodating housing 1 includes a bottom wall 12 and a surrounding wall 11 connected to the periphery of the bottom wall 12, and the bottom wall 12 and the surrounding wall 11 define an accommodating cavity 10 having an open end. The accommodating housing 1 further includes a flange 13 extending from the end of the surrounding wall 11.

[0028] The accommodating housing 1 is approximately box-shaped, and the accommodating housing 1 has a first side 141 and a second side 142 opposite to each other, and a pair of connecting sides 143, 144 connected to the first side 141 and the second side 142. In this embodiment, the first side 141, the second side 142 and the connecting sides 143, 144 respectively include corresponding portions of the surrounding wall 11 and the flange 13. It should be understood that in embodiments where the accommodating housing is not provided with the flange or is provided with the flange along only a part of the surrounding wall 11, the first side, the second side and/or the connecting sides may not include the flange.

[0029] An electrical module 3 is accommodated in the accommodating cavity 10. The electrical module 3 includes at least one circuit board and/or other electrical components. In this embodiment, the electrical module 3 includes at least one control unit including a central processing unit.

[0030] The second side 142 of the accommodating housing 1 is provided with a cable hole 151, 152 penetrating the surrounding wall 11. A cable passes through the corresponding cable hole 151, 152 to be connected to the electrical module 3.

[0031] The refrigeration appliance includes a cover 2 detachably connected to the accommodating housing 1 for sealing the accommodating cavity 10. The cover 2 is approximately board-shaped. A seal ring 4 is disposed between the cover 2 and the accommodating housing 1. The seal ring 4 may be fixed on the inner side facing the accommodating housing 1 of the cover 2 in advance. To implement the fixing, the inner side of the cover 2 may be provided with a positioning slot 23 for fixing the seal ring 4.

[0032] As shown in FIG. 2 and FIG. 4, the first side 141 of the accommodating housing 1 is provided with a pair of slots 171, 172 that are parallel to each other and in communication with the accommodating cavity 10. The slots 171, 172 may be parallel to the bottom wall 12 and the cover 2. The slots 171, 172 may be dented outwards from a portion corresponding to the first side 141 of the surrounding wall 11, and therefore, the outer side of the surrounding wall 11 is provided with protruded portions 181, 182 respectively corresponding to the slots 171, 172.

[0033] The inner side of the cover 2 is provided with multiple extension portions 211, 212 (only two extension portions are shown) extending towards the bottom wall 12 of the accommodating housing 1.

[0034] Each of the extension portions 211, 212 has an approximately L-shaped section, and includes a connection portion 2112 approximately perpendicular to the outer surface of the cover 2 and an insert portion 2111 located at the end of the extension portion 211 and extending towards the first side 141 of the accommodating housing 1. The connection portion 2112 is connected to an area of the cover 2 that is located within the seal ring 4. A lower surface of the insert portion 2111 may be parallel to the cover 2.

[0035] In this embodiment, two insert portions 2111 arranged at an interval are inserted into each of the slots 171, 172. Each insert portion 2111 may adjoin a side end surface of the corresponding slot 171, 172, so that the cover 2 can be limited in a direction perpendicular to the side end surface of the slot 171, 172.

[0036] When the insert portions 2111 are inserted into the corresponding slots 171, 172, an angle is formed between a direction in which the insert portions 2111 are inserted into the slots 171, 172 and a central axis of the accommodating housing 1, that is, the insert portions 2111 are not inserted into the corresponding slots 171, 172 in the direction parallel to the central axis of the accommodating housing 1. This helps to form a limit relation between the insert portions 2111 and the corresponding slots 171, 172 in the direction of the central axis.

[0037] Spacing is kept between the slot 171, 172 and the opening of the accommodating cavity 10 in the depth direction of the accommodating cavity 10. That is, the slot is located between the seal ring 4 and the bottom wall 12 of the accommodating housing 1 in the depth direction of the accommodating cavity 10, and the insert portions 2111 at the end of the extension portion 211 are connected to the slot 171, 172 in the accommodating cavity 10 in an inserting-receiving way.

[0038] The upper surface of the insert portion 2111 has a wedge-shaped guide slope surface. Thus, it is easier to insert the insert portion 2111 into the slot 171, 172.

[0039] The second side 142 of the accommodating housing 1 is connected to the connecting sides 143, 144 and the cover 2 by multiple fixing mechanisms. The fixing mechanisms are arranged in such a way that the cover 2 is pressed to the accommodating housing 1 and press-

es the seal ring 4 to make the seal ring 4 deform.

[0040] In this embodiment, some of the multiple fixing mechanisms are formed by screw thread connection devices 5 that connect and pass through the cover 2 and the accommodating housing 1. Each screw thread connection device 5 includes a corresponding first hole 241, 242, 243 penetrating the cover 2, a corresponding second hole 161, 162, 163 penetrating the flange 13 on the accommodating housing 1, and a screw 7 screwed into the corresponding first hole 241, 242, 243 and second hole 161, 162, 163. When the screw 7 is tightened, the cover 2 can be pressed to the accommodating housing 1 to make the seal ring 4 deform.

[0041] Others of the multiple fixing mechanisms are formed by buckling structures 6 for buckling the cover 2 and the accommodating housing 1. The buckling structure 6 includes an elastic hook 221, 222 extending towards the bottom wall 12 from the inner side of the cover 2 and a protruding hook 19 protruding from the inner side of the surrounding wall 11. The elastic hook 221, 222 can be connected to an area surrounded by the seal ring 4 of the cover 2. The protruding hook 19 protrudes gradually towards the bottom wall 12 from the opening of the accommodating cavity 10 and forms a hook connecting surface 190 on a side facing the bottom wall 12. Thus, when the cover 2 is pressed to the accommodating housing 1, the elastic hook 221, 222 can deform, extend beyond the protruding hook 19, and be connected to the hook connecting surface 190 under the effect of the protruding hook 19, so that the cover 2 can be pulled to the accommodating housing 1 to make the seal ring 4 deform.

[0042] It should be understood that in an alternative embodiment, the fixing mechanisms can all be made up of the screw thread connection devices 5, or be made up of the buckling structures 6.

[0043] Various embodiments for describing each single part with reference to FIG. 1 to FIG. 4 may be combined in any given manner to achieve the advantages of the present invention. In addition, the present invention is not limited to the shown embodiments, and generally means other than the shown means may be used, as long as they can achieve the same effect.

Claims

1. A refrigeration appliance, comprising: an accommodating housing (1) with an accommodating cavity (10) having an open end, at least one electrical component (3) disposed in the accommodating housing (1), and a cover (2) for sealing the accommodating cavity (10), the accommodating housing (1) having a first side (141) and a second side (142) opposite to each other, **characterized in that** the refrigeration appliance further comprises a seal ring (4) disposed between the cover (2) and the accommodating housing (1), one of the cover (2) and the first side (141)

of the accommodating housing (1) is provided with a slot (171, 172), the other of the cover (2) and the accommodating housing (1) is provided with an insert portion (2111) for being inserted into the slot (171, 172), an angle is formed between a direction in which the insert portion (2111) is inserted into the slot (171, 172) and a central axis (A) of the accommodating housing (1), the second side (142) is connected to the cover (2) by at least one fixing mechanism, and the fixing mechanism makes the cover (2) press the seal ring (4) in a direction towards the accommodating housing (1).

2. The refrigeration appliance according to claim 1, **characterized in that** the insert portion (2111) is connected to the slot (171, 172) between the seal ring (4) and a bottom wall (12) of the accommodating housing (1) in a depth direction of the accommodating cavity (10).
3. The refrigeration appliance according to claim 1, **characterized in that** an extension portion (211) extending towards the bottom wall (12) of the accommodating housing (1) for being connected to the first side (141) in an inserting-receiving way is provided on an inner side of the cover (2), and the extension portion (211) is connected to an area of the cover (2) that is located within the seal ring (4).
4. The refrigeration appliance according to claim 3, **characterized in that** an end of the extension portion (211) forms the insert portion (2111) extending towards the first side (141).
5. The refrigeration appliance according to claim 4, **characterized in that** the extension portion (211) has an approximately L-shaped section.
6. The refrigeration appliance according to any one of claims 1-5, **characterized in that** at least two of the insert portions (2111) arranged at an interval are inserted into the slot (171, 172), and each insert portion (2111) adjoins a corresponding end surface of the slot (171).
7. The refrigeration appliance according to any one of claims 1-5, **characterized in that** the slot (171, 172) and/or the insert portion (2111) is at least approximately parallel to the cover (2).
8. The refrigeration appliance according to any one of claims 1-5, **characterized in that** the insert portion (2111) and/or the slot (171, 172) is provided with a wedge-shaped guide structure.
9. The refrigeration appliance according to any one of claims 1-5, **characterized in that** the slot (171, 172) is concaved outwards from a wall (11) of the first side

(141).

10. The refrigeration appliance according to any one of claims 1-5, **characterized by** comprising a plurality of the fixing mechanisms.
11. The refrigeration appliance according to claim 10, **characterized in that** at least one of the fixing mechanisms comprises a screw (7) penetrating the cover (2) and connected to the accommodating housing (1).
12. The refrigeration appliance according to claim 10 or 11, **characterized in that** at least one of the fixing mechanisms comprises a buckling structure (6) for buckling the cover (2) and the accommodating housing (1).
13. The refrigeration appliance according to claim 12, **characterized in that** the buckling structure (6) comprises an elastic hook (221, 222) extending towards the bottom wall (12) of the accommodating housing (1) from the inner side of the cover (2), and the elastic hook (221, 222) is connected to an area of the cover (2) that is located within the seal ring (4).
14. The refrigeration appliance according to any one of claims 1-5, **characterized in that** the accommodating housing (1) is provided with at least one cable hole (151, 152) penetrating the wall (11) of the accommodating housing (1), and the cable hole (151, 152) is located in the second side (142).

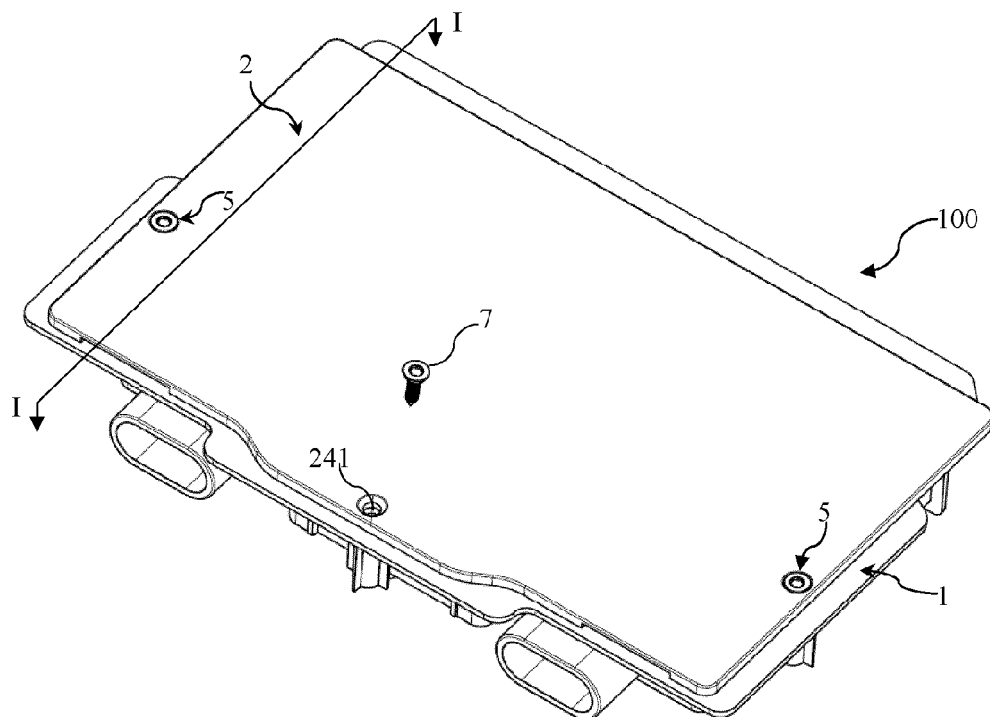


FIG. 1

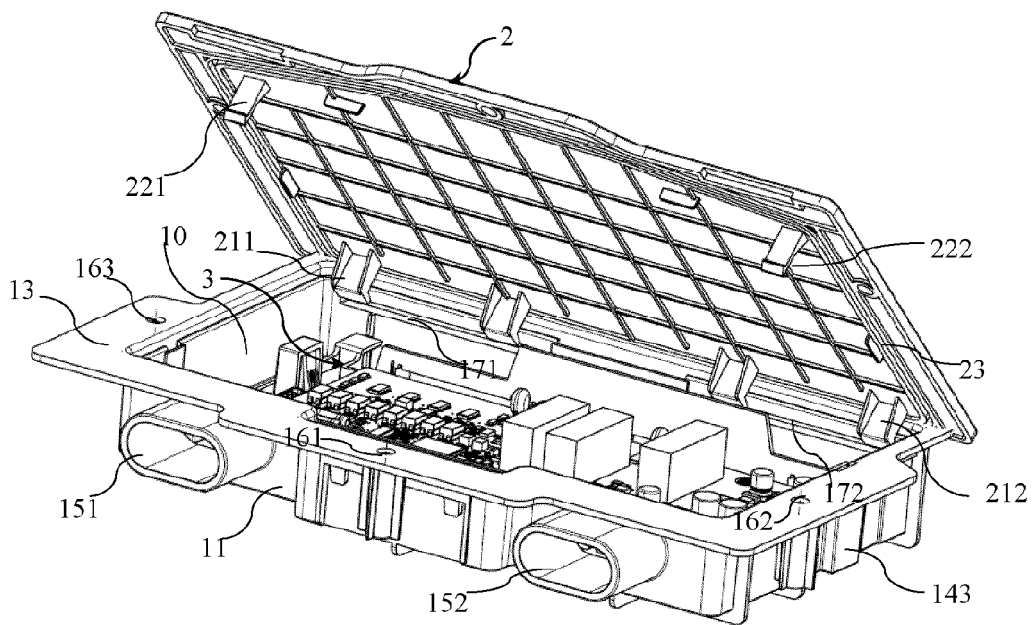


FIG. 2

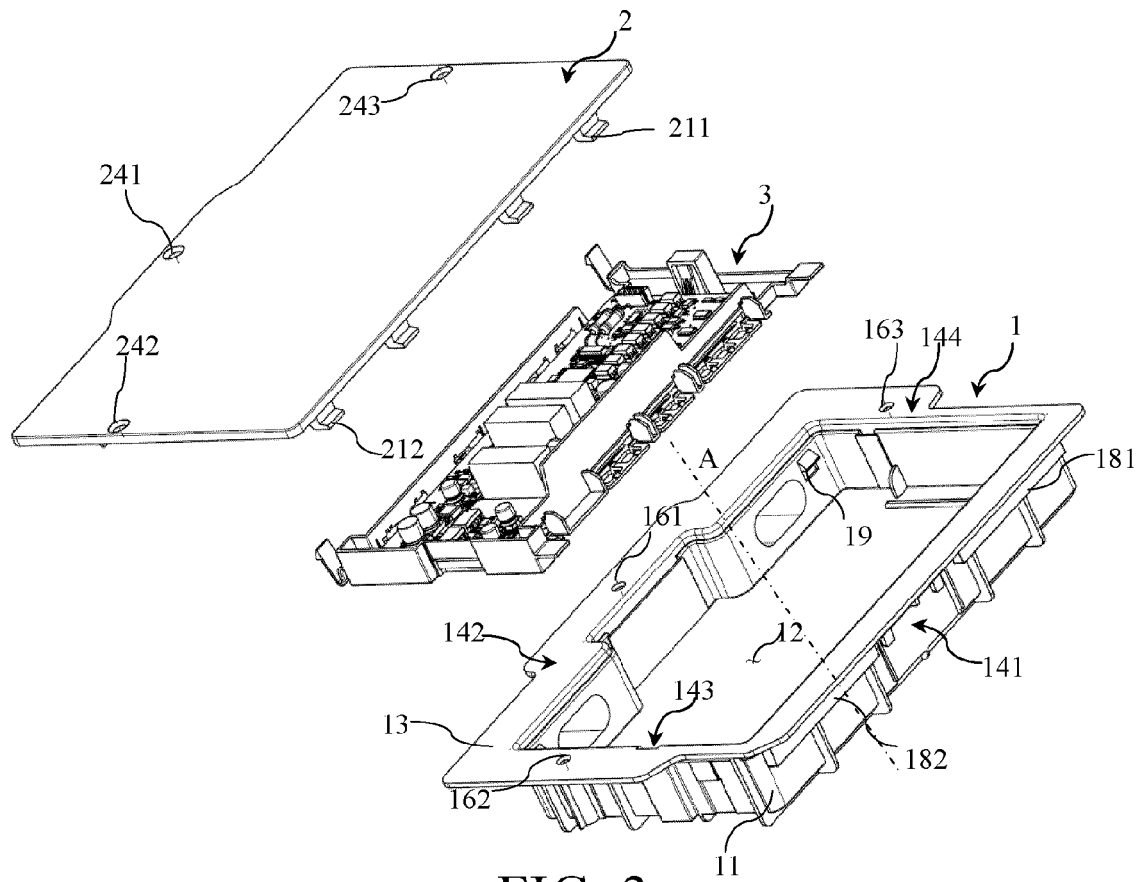


FIG. 3

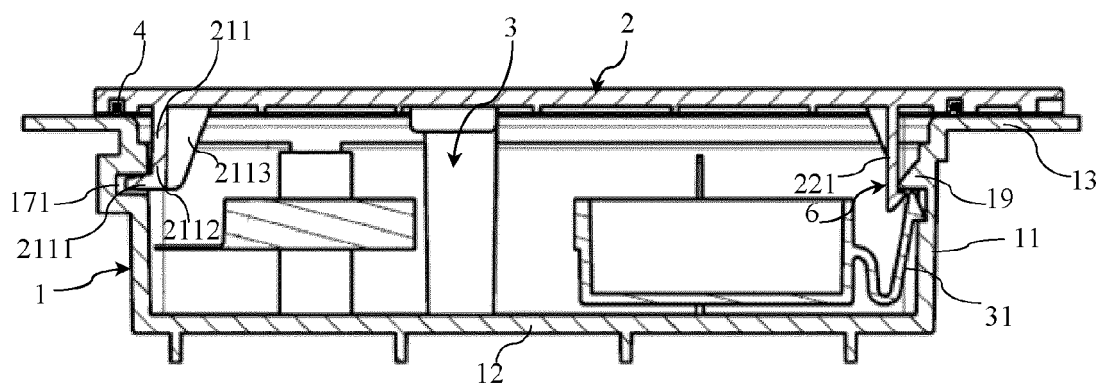


FIG. 4