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Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of ceiling-embedded air conditioners, and more particularly to a ceiling-embedded air conditioner.

BACKGROUND

[0002] An indoor unit of a ceiling-embedded air conditioner is generally mounted on the top of a wall. The ceiling-embedded air conditioner includes numerous parts. During the mounting, when a drain pan is mounted on an outer shell, various mounting surfaces and mounting holes need to be aligned. The alignment of the mounting holes is slow, and the assembly is difficult, which affects the mounting efficiency.

[0003] In addition, a gap easily exists between the drain pan and the outer shell after completion of the mounting, which affects the airtightness of the ceiling-embedded air conditioner, easily leading to condensation at a joint.

CN 201 348 314 Y relates generally to a ceiling embedded air conditioner.

SUMMARY

[0004] The scope of the invention is set out in the claims. The present disclosure seeks to solve at least one of the technical problems existing in the related art to some extent.

[0005] Therefore, an objective of the present disclosure is to provide a ceiling-embedded air conditioner. The ceiling-embedded air conditioner features quick alignment, high installation efficiency, and good airtightness.

[0006] The ceiling-embedded air conditioner according to embodiments of the present disclosure includes: an outer shell, an accommodating cavity is provided in the outer shell, a bottom of the outer shell being open, an outer circumferential side of the outer shell being connected to a first fixing structure; and a drain pan fitted at the bottom of the outer shell, an outer circumferential side of the drain pan being provided with a second fixing structure connected to the first fixing structure, wherein a first mounting hole and a prefixing groove are provided on the first fixing structure, a second mounting hole and a prefixing hook are provided on the second fixing structure, and when the prefixing hook is clamped in the prefixing groove, the first mounting hole is aligned with the second mounting hole.

[0007] The ceiling-embedded air conditioner according to the embodiments of the present disclosure enables the formation of a stable connection relationship between the drain pan and the outer shell through mutual connection between the first fixing structure and the second fixing structure. Through engagement of the prefixing groove and the prefixing hook, the first mounting hole on

the first fixing structure and the second mounting hole on the second fixing structure may be quickly aligned, which greatly increases the mounting efficiency.

[0008] Optionally, a plurality of first fixing structures are provided, the plurality of first fixing structures are disposed around the outer shell, and a plurality of second fixing structures respectively corresponding to the plurality of the first fixing structures in an one-to-one manner are disposed around the drain pan.

[0009] The drain pan is provided with a reinforcing rib at a junction with the first fixing structure.

[0010] Optionally, the first fixing structure is a plate, and the first fixing structure includes: a fitting section connected on an outer circumferential surface of the outer shell; a transverse extension section extending from a bottom of the fitting section in a direction away from the outer shell, the first mounting hole being disposed on the transverse extension section; and a vertical extension section extending downward from a side of the transverse extension section away from the fitting section, wherein a horizontal width of the vertical extension section is smaller than that of the transverse extension section, a portion by which the vertical extension section is shorter than the transverse extension section constitutes the prefixing groove, the second fixing structure is fitted at a bottom of the transverse extension section, the prefixing hook is clamped at the prefixing groove, and the vertical extension section is clamped on a side of the second fixing structure away from the outer shell.

[0011] Optionally, the prefixing hook is provided with a guide surface on a side toward the transverse extension section.

[0012] Optionally, an upper surface of the transverse extension section is provided with a convex edge surrounding the first mounting hole, and the convex edge is integrally formed on the transverse extension section by stamping.

[0013] Optionally, an inner side of the outer shell is provided with an insulating shell with the same shape as the outer shell, and the drain pan is connected at a bottom of the insulating shell.

[0014] Optionally, the drain pan includes: a central pan disposed below an evaporator of the ceiling-embedded air conditioner; a plurality of circumferentially connected portions circumferentially spaced apart on an outer side of the central pan, the plurality of circumferentially connected portions being connected below the insulating shell and connected on an inner circumferential surface of the outer shell; and a plurality of connecting portions each connected between the central pan and the circumferentially connected portions, wherein each of the circumferentially connected portions is provided with the second fixing structure.

[0015] Optionally, a plurality of joints are provided on a circumferential wall of the insulating shell, each of the joints is open downward, and at least part of top surfaces of the joints are arc-shaped surfaces, the circumferentially connected portions are fitted in the joints, and top

surfaces of the circumferentially connected portions are closely fitted with the top surfaces of the joints.

[0016] Optionally, the top surfaces of the circumferentially connected portions form a downward curved arc-shaped surface at each of two circumferential ends.

[0017] Additional aspects and advantages of the present disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1 is a schematic diagram of a three-dimensional structure of a ceiling-embedded air conditioner according to an embodiment of the present disclosure. Fig. 2 is a schematic diagram of a drain pan, an outer shell, and an insulating shell of a ceiling-embedded air conditioner according to an embodiment of the present disclosure.

Fig. 3 is a schematic structural diagram of fitting of a drain pan and an insulating shell of a ceiling-embedded air conditioner according to an embodiment of the present disclosure.

Fig. 4 is a schematic diagram of an overhead structure of a drain pan according to an embodiment of the present disclosure.

Fig. 5 is a partial schematic diagram of a second fixing structure at a corner of a drain pan according to an embodiment of the present disclosure.

Fig. 6 is a partial cross-sectional view of an A-A section in Fig. 5.

Fig. 7 is a schematic diagram of an overall structure of a first fixing structure according to an embodiment of the present disclosure.

[0019] Reference numerals: ceiling-embedded air conditioner 100; outer shell 10; accommodating cavity 101; air outlet 102; first fixing structure 11; fitting section 111; transverse extension section 112; first mounting hole 1121; convex edge 1122; vertical extension section 113; prefixing groove 114; carrying plate 115; drain pan 20; central pan 21; air inlet 211; connecting portion 22; circumferentially connected portion 23; second fixing structure 231; second mounting hole 2311; prefixing hook 2312; reinforcing rib 2313; guide surface 2314; curved arc-shaped surface 232 insulating shell 30; joint 31.

DETAILED DESCRIPTION

[0020] Reference will be made in detail to the embodiments of the present disclosure, and the examples of the embodiments are illustrated in the drawings, wherein the same or similar elements and the elements having same or similar functions are denoted by like reference

numerals throughout the descriptions. The embodiments described herein with reference to drawings are illustrative, and merely used to explain the present disclosure.

[0021] A ceiling-embedded air conditioner 100 according to an embodiment of the present disclosure is described in detail below with reference to the accompanying drawings.

[0022] The ceiling-embedded air conditioner 100 according to an embodiment of the present disclosure, as shown in Fig. 1 and Fig. 3, includes: an outer shell 10 and a drain pan 20.

[0023] As shown in Fig. 1 and Fig. 3, the outer shell 10 is provided therein with an accommodating cavity 101, and the bottom of the outer shell 10 is open. An evaporator, a fan assembly, an auxiliary heating member, and other parts may be mounted in the accommodating cavity 101. The bottom is open to communicate with the accommodating cavity 101, for convenient assembly of internal components.

[0024] As shown in Fig. 3, an outer circumferential side of the outer shell 10 is connected to a first fixing structure 11.

[0025] As shown in Fig. 1 to Fig. 3, the drain pan 20 is fitted at the bottom of the outer shell 10, and an outer circumferential side of the drain pan 20 is provided with a second fixing structure 231 connected to the first fixing structure 11. The drain pan 20 is fitted at one open side of the outer shell 10, so that the parts in the accommodating cavity 101 can be shielded and the sense of wholeness of the ceiling-embedded air conditioner 100 is enhanced. The drain pan 20 may collect condensate water that condenses on the components of the ceiling-embedded air conditioner 100 in a refrigeration mode, so as to prevent the condensate water from falling directly on the indoor floor to result in poor user experience.

[0026] Specifically, as shown in Fig. 2, Fig. 3, and Fig. 7, the first fixing structure 11 is provided with a first mounting hole 1121 and a prefixing groove 114.

[0027] As shown in Fig. 2, Fig. 3, Fig. 4, Fig. 5, and Fig. 6, the second fixing structure 231 is provided with a second mounting hole 2311 and a prefixing hook 2312. When the prefixing hook 2312 is clamped in the prefixing groove 114, the first mounting hole 1121 is aligned with the second mounting hole 2311.

[0028] Here, since prefixing is formed between the prefixing hook 2312 and the prefixing groove 114, limit is formed between the first fixing structure 11 and the second fixing structure 231, and the first mounting hole 1121 and the second mounting hole 2311 of the two are aligned quickly to facilitate bolt fixing.

[0029] It may be understood that compared with the assembly of a drain pan 20 of an ordinary ceiling-embedded air conditioner 100 without a prefixing structure, the present disclosure enhances the strength of connection between the first fixing structure 11 and the second fixing structure 2312, thus forming a stable connection relationship between the drain pan 20 and the outer shell 10. In addition, the quick alignment of the first mounting hole

1121 and the second mounting hole 2311 improves the fitting efficiency between the first fixing structure 11 and the second fixing structure 2312, thereby greatly improving the assembly efficiency between the drain pan 20 and the outer shell 10.

[0030] In some embodiments of the present disclosure, as shown in Fig. 2, a plurality of first fixing structures 11 are provided, the plurality of first fixing structures 11 are disposed around the outer shell 10, and a plurality of second fixing structures 231 respectively corresponding to the plurality of the first fixing structures in an one-to-one manner are disposed around the drain pan 20. The plurality of first fixing structures 11 are disposed on the outer shell 10 respectively, which may increase connection points between the drain pan 20 and the outer shell 10, so that relatively stable connections are formed in all directions of the drain pan 20 and the outer shell 10, and a fitting surface difference between the drain pan 20 and the outer shell 10 can be reduced, thereby preventing excessively askew mounting of the drain pan 20.

[0031] Optionally, as shown in Fig. 2, four first fixing structures 11 are provided. The first fixing structures 11 are evenly spaced at four corners of the outer shell 10 respectively. The drain pan 20 is also provided with four second fixing structures 231 matching the first fixing structures 11. The number of the first fixing structures 11 and the number of the second fixing structures 231 may be selectively set according to an actual requirement, provided that stability and balance of the mounting and the aesthetics of the ceiling-embedded air conditioner 100 after mounting are ensured in case of no waste of costs and convenient quick mounting.

[0032] As shown in Fig. 3 and Fig. 6, the drain pan 20 is provided with a reinforcing rib 2313 at a junction with the first fixing structure 11. The setting of the reinforcing rib 2313 enhances local strength of the second fixing structure 231, prevents the crack of the second fixing structure 231 and the first fixing structure 11 due to fitting, and enhances the service life of the second fixing structure 231.

[0033] Advantageously, reinforcing ribs are added around the second mounting hole 2311 to enhance the strength at the second mounting hole 2311.

[0034] In some embodiments of the present disclosure, as shown in Fig. 7, the first fixing structure 11 is a plate, and the first fixing structure 11 includes: a fitting section 111, a transverse extension section 112, and a vertical extension section 113.

[0035] As shown in Fig. 2, the fitting section 111 is connected to an outer circumferential surface of the outer shell 10. The fitting section 111 makes the first fixing structure 11 fitted stably on a side surface of the outer shell 10, which is not easy to fall off. The fitting section 111 further increases a fit area between the first fixing structure 11 and the outer shell 10. The fitting section 111 and the outer shell may be fixed by screw connection or welding connection.

[0036] As shown in Fig. 2, Fig. 3, and Fig. 7, the trans-

verse extension section 112 extends from the bottom of the fitting section 111 in a direction away from the outer shell 10, and the first mounting hole 1121 is disposed on the transverse extension section 112. The transverse extension section 112 provides the first mounting hole 1121 with a surface protruding beyond the outer shell 10, so that the first fixing structure 11 and the second fixing structure 231 are more convenient to mount and fit, which facilitates manual operations and is easy to observe. In addition, during fixing, the first fixing structure 11 and the second fixing structure 231 do not affect the strength of the outer shell 10 and do not damage the outer shell 10.

[0037] As shown in Fig. 2 and Fig. 7, the vertical extension section 113 extends downward from a side of the transverse extension section 112 away from the fitting section 111. A horizontal width of the vertical extension section 113 is smaller than that of the transverse extension section 112, and a portion by which the vertical extension section 113 is shorter than the transverse extension section 112 constitutes the prefixing groove 114. A mounting groove is also formed between the vertical extension section 113 extending downward and the transverse extension section 112, which is convenient to cooperate with a mounting surface of the second fixing structure 231, so that the second fixing structure 231 is embedded in the mounting groove during prefixing, to accelerate the cooperation of the two.

[0038] Advantageously, an obtuse angle is formed between the vertical extension section 113 and the transverse extension section 112, and a left side of the vertical extension section 113 matches a right side of the prefixing hook 2312. Such design facilitates quick pre-positioning.

[0039] As shown in Fig. 2 and Fig. 3, the second fixing structure 231 is fitted at the bottom of the transverse extension section 112, the prefixing hook 2312 is clamped at the prefixing groove 114, and the vertical extension section 113 is clamped on a side of the second fixing structure 231 away from the outer shell 10. The prefixing groove 114 makes it easy to form a clamping hook matching limit structure with the prefixing hook 2312.

[0040] Optionally, as shown in Fig. 3, an upper surface of the transverse extension section 112 is provided with a convex edge 1122 surrounding the first mounting hole 1121, and the convex edge 1122 is integrally formed on the transverse extension section 112 by stamping. The convex edge 1122, on the one hand, can enhance the strength of the first mounting hole 1121, and on the other hand, also has a certain guiding effect, which facilitates guiding during mounting of bolts or screws.

[0041] Optionally, as shown in Fig. 3 and Fig. 7, the vertical extension section 113 extends toward a direction away from the outer shell 10 to form another transverse extension section 112. This facilitates prefixing and limiting.

[0042] Optionally, as shown in Fig. 3 and Fig. 7, the fitting section 111 on a side of the vertical extension section 113 shorter than the transverse extension section

112 is provided with a carrying plate 115. An upper surface of the carrying plate 115 is in contact with the second fixing structure 231, which may increase a supporting degree of a lower surface of the second fixing structure 231 and prevent an upper mounting hole from falling off after the fitting fails. In addition, the carrying plate 115 fits the vertical extension section 113 in a staggered manner. The carrying plate 115 may provide a certain guiding effect for the mounting of the second fixing structure 231.

[0043] Optionally, as shown in Fig. 3, Fig. 5, and Fig. 6, the prefixing hook 2312 is provided with a guide surface 2314 on a side toward the transverse extension section 112. The setting of the guide surface 2314 facilitates clamping the prefixing hook 2312 onto the prefixing groove 114.

[0044] In some embodiments of the present disclosure, as shown in Fig. 1 to Fig. 4, the drain pan 20 includes: a central pan 21, a plurality of circumferentially connected portions 23, and a plurality of connecting portions 22.

[0045] The central pan 21 is disposed below an evaporator of the ceiling-embedded air conditioner 100, and is configured to receive water.

[0046] Optionally, an air inlet 211 is formed in the middle of the central pan 21, and annular flanges are formed around the air inlet 211.

[0047] As shown in Fig. 1, Fig. 2, and Fig. 4, the plurality of circumferentially connected portions 23 are circumferentially spaced apart on an outer side of the central pan 21, the plurality of circumferentially connected portions 23 are connected below the insulating shell 30 and connected on an inner circumferential surface of the outer shell 10, and each of the circumferentially connected portions 23 is provided with the second fixing structure 231. The circumferentially connected portions 23 provide connection points for the second fixing structure 231, so that the second fixing structure 231 can match the transverse extension section 112.

[0048] Each connecting portion 22 is connected between the central pan 21 and the circumferentially connected portions 23. The connecting portions 22 make the circumferentially connected portions 23 extend in an appropriate direction, and the central pan 21 does not need to be provided with the connecting portions 22 everywhere.

[0049] As shown in Fig. 1, an air outlet 102 in communication with the accommodating cavity 101 is formed between adjacent connecting portions 22, a side edge of the central pan 21, and the outer shell 10. The air outlet 22 may re-feed an air flow after heat exchange indoors.

[0050] In some embodiments of the present disclosure, as shown in Fig. 2 and Fig. 3, an inner side of the outer shell 10 is provided with an insulating shell 30 with the same shape as the outer shell 10, and the drain pan 20 is connected at the bottom of the insulating shell 30.

[0051] As shown in Fig. 3, a circumferential wall of the insulating shell 30 is provided with a plurality of joints 31, each of the joints 31 is open downward, and at least part

of top surfaces of the joints 31 are arc-shaped surfaces, the circumferentially connected portions 23 are fitted in the joints 31, and top surfaces of the circumferentially connected portions 23 are closely fitted with the top surfaces of the joints 31.

[0052] Correspondingly, as shown in Fig. 3, the top surfaces of the circumferentially connected portions 23 form a downward curved arc-shaped surface 232 at each of two circumferential ends. The curved arc-shaped surface 232 matches the joints 31, so that the drain pan 20 fits in with the outer shell 10, and the joints have good airtightness. This reduces the formation of condensation on the outer shell 10 of the ceiling-embedded air conditioner 100 in the refrigeration mode. The air in the accommodating cavity 101 and the air outside the ceiling-embedded air conditioner 100 are not easy to form an exchange region beyond the air inlet 211 and the air outlet 102.

[0053] In order to better understand the solutions of the embodiments of the present disclosure, the structure of the ceiling-embedded air conditioner 100 in one specific embodiment of the present disclosure is described below with reference to Fig. 1 to Fig. 7.

[0054] As shown in Fig. 1 and Fig. 3, the ceiling-embedded air conditioner 100 includes: an outer shell 10, a drain pan 20, and an insulating shell 30.

[0055] As shown in Fig. 1 and Fig. 3, the top of the outer shell 10 is mounted to the top of a wall, and the bottom of the outer shell 10 is provided with the drain pan 20. The outer shell 10 is provided with an accommodating cavity 101, one air inlet 211 in communication with the accommodating cavity 101 and four air outlets 102 in communication with the accommodating cavity 101 are formed on the drain pan 20. An inner side of the outer shell 10 is provided with the insulating shell 30 with the same shape as the outer shell 10, an outer circumferential side of the outer shell 10 is connected to four first fixing structures 11, and an outer circumferential side of the drain pan 20 is connected to a second fixing structure 231 connected to the first fixing structures 11.

[0056] As shown in Fig. 2, Fig. 3, and Fig. 7, the first fixing structure 11 is a plate, and the first fixing structure 11 includes: a fitting section 111, a transverse extension section 112, and a vertical extension section 113. The fitting section 111 is connected to an outer circumferential surface of the outer shell 10, the transverse extension section 112 extends from the bottom of the fitting section 111 in a direction away from the outer shell 10, and the first mounting hole 1121 is disposed on the transverse extension section 112. The vertical extension section 113 extends downward from a side of the transverse extension section 112 away from the fitting section 111. A horizontal width of the vertical extension section 113 is smaller than that of the transverse extension section 112, and a portion by which the vertical extension section 113 is shorter than the transverse extension section 112 constitutes the prefixing groove 114.

[0057] As shown in Fig. 1, Fig. 2, Fig. 3, and Fig. 4, the

drain pan 20 includes: a central pan 21, four circumferentially connected portions 23, and eight connecting portions 22. The central pan 21 is disposed below an evaporator of the ceiling-embedded air conditioner 100, each connecting portion 22 is connected between the central pan 21 and the circumferentially connected portions 23, the plurality of circumferentially connected portions 23 are circumferentially spaced apart on an outer side of the central pan 21, the plurality of circumferentially connected portions 23 are connected below the insulating shell 30 and connected on an inner circumferential surface of the outer shell 10, and each circumferentially connected portion 23 is provided with the second fixing structure 231. Top surfaces of the circumferentially connected portions 23 form a downward curved arc-shaped surface 232 at each of two circumferential ends, and the curved arc-shaped surface 232 matches joints 31 on the insulating shell 30.

[0058] As shown in Fig. 2, Fig. 3, Fig. 4, Fig. 5, and Fig. 6, the second fixing structure 231 is provided with a second mounting hole 2311 and a prefixing hook 2312. When the prefixing hook 2312 is clamped in the prefixing groove 114, the first mounting hole 1121 is aligned with the second mounting hole 2311.

[0059] A contact area between the drain pan 20 and the insulating shell 30 is small, the arc-shaped surface is fitted, and the sealing is tight.

[0060] Thus, the ceiling-embedded air conditioner 100 of the present disclosure can reduce ground wire materials, isolate contact of wire bodies with foam, and have a high fireproofing grade.

[0061] In the description of the present disclosure, it is to be understood that terms such as "upper", "lower", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", and "circumferential" should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present disclosure be constructed or operated in a particular orientation, thus cannot be construed to limit the present disclosure.

[0062] Furthermore, the feature defined with "first" and "second" may include one or more of this feature explicitly or implicitly, which are used to distinguish and describe features without distinction of order or importance.

[0063] In the description of the present disclosure, "a plurality of" means two or more, unless otherwise stated.

[0064] In the description of the present disclosure, it should be noted that unless specified or limited otherwise, the terms "mounted", "connected", and "coupled" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integral connections; may also be mechanical or electrical connections; may also be direct connections or indirect connections via intervening structures; may also be inner communications of two elements. The above terms can be understood by those of ordinary skill in the art according to specific situations.

Claims

1. A ceiling-embedded air conditioner (100), comprising:

an outer shell (10), an accommodating cavity (101) being provided in the outer shell (10), a bottom of the outer shell (10) being open, an outer circumferential side of the outer shell (10) being connected to a first fixing structure (11); and

a drain pan (20) fitted at the bottom of the outer shell (10), an outer circumferential side of the drain pan (20) being provided with a second fixing structure (231) connected to the first fixing structure (11), wherein

a first mounting hole (1121) and a prefixing groove (114) are provided on the first fixing structure (11), a second mounting hole (2311) and a prefixing hook (2312) are provided on the second fixing structure (231), and when the prefixing hook (2312) is clamped in the prefixing groove (114), the first mounting hole (1121) is aligned with the second mounting hole (2311);

characterised in that the drain pan (20) is provided with a reinforcing rib (2313) at a junction with the first fixing structure (11).

2. The ceiling-embedded air conditioner according to claim 1, wherein a plurality of first fixing structures (11) are provided, the plurality of first fixing structures (11) are disposed around the outer shell (10), and a plurality of second fixing structures (231) respectively corresponding to the plurality of the first fixing structures (11) in an one-to-one manner are disposed around the drain pan (20).

3. The ceiling-embedded air conditioner according to claims 1 or 2, wherein the first fixing structure (11) is a plate, and the first fixing structure (11) comprises:

a fitting section (111) connected on an outer circumferential surface of the outer shell (10);

a transverse extension section (112) extending from a bottom of the fitting section (111) in a direction away from the outer shell (10), the first mounting hole (1121) being disposed on the transverse extension section (112); and

a vertical extension section (113) extending downward from a side of the transverse extension section (112) away from the fitting section (111), wherein a horizontal width of the vertical extension section (113) is smaller than a horizontal width of the transverse extension section (112), and a portion by which the vertical extension section (113) is shorter than the transverse extension section (112) constitutes the prefixing groove (114),

wherein the second fixing structure (231) is fitted at a bottom of the transverse extension section (112), the prefixing hook (2312) is clamped at the prefixing groove (114), and the vertical extension section (113) is clamped on a side of the second fixing structure (231) away from the outer shell (10).

4. The ceiling-embedded air conditioner according to claim 3, wherein the prefixing hook (2312) is provided with a guide surface (2314) on a side toward the transverse extension section (112).

5. The ceiling-embedded air conditioner according to claim 3 or 4, wherein an upper surface of the transverse extension section (112) is provided with a convex edge (1122) surrounding the first mounting hole (1121), and the convex edge (1122) is integrally formed on the transverse extension section (112) by stamping.

6. The ceiling-embedded air conditioner according to any one of claims 1 to 5, wherein an inner side of the outer shell (10) is provided with an insulating shell (30) with the same shape as the outer shell (10), and the drain pan (20) is connected at a bottom of the insulating shell (30).

7. The ceiling-embedded air conditioner according to claim 6, wherein the drain pan (20) comprises:

a central pan (21) disposed below an evaporator of the ceiling-embedded air conditioner (100); a plurality of circumferentially connected portions (23) circumferentially spaced apart on an outer side of the central pan (21), the plurality of circumferentially connected portions (23) being connected below the insulating shell (30) and connected on an inner circumferential surface of the outer shell (10); and

a plurality of connecting portions (22) each connected between the central pan (21) and the circumferentially connected portions (23), wherein each of the circumferentially connected portions (23) is provided with the second fixing structure (231).

8. The ceiling-embedded air conditioner according to claim 7, wherein a plurality of joints (31) are provided on a circumferential wall of the insulating shell (30), each of the joints (31) is open downward, and at least part of top surfaces of the joints (31) are arc-shaped surfaces, the circumferentially connected portions (23) are fitted in the joints (31), and top surfaces of the circumferentially connected portions (23) are closely fitted with the top surfaces of the joints (31).

9. The ceiling-embedded air conditioner according to

claim 7 or 8, wherein top surfaces of the circumferentially connected portions (23) form a downward curved arc-shaped surface (232) at each of two circumferential ends.

Patentansprüche

1. In eine Zimmerdecke eingebettete Klimaanlage (100), umfassend:

eine äußere Hülle (10), einen Unterbringungshohlraum (101), der in der äußeren Hülle (10) bereitgestellt ist, wobei eine Unterseite der äußeren Hülle (10) offen ist, eine außen umlaufende Seite der äußeren Hülle (10) an eine erste Befestigungsstruktur (11) angeschlossen ist, und

eine Auffangwanne (20), die an der Unterseite der äußeren Hülle (10) eingepasst ist, wobei eine außen umlaufende Seite der Auffangwanne (20) mit einer zweiten Befestigungsstruktur (231) versehen ist, die an die erste Befestigungsstruktur (11) angeschlossen ist, wobei eine erste Montageöffnung (1121) und eine Vorbefestigungsrinne (114) an der ersten Befestigungsstruktur (11) bereitgestellt sind, eine zweite Montageöffnung (2311) und ein Vorbefestigungshaken (2312) an der zweiten Befestigungsstruktur (231) bereitgestellt sind und die erste Montageöffnung (1121) an der zweiten Montageöffnung (2311) ausgerichtet ist, wenn der Vorbefestigungshaken (2312) in die Vorbefestigungsrinne (114) geklemmt ist,

dadurch gekennzeichnet, dass die Auffangwanne (20) an einem Kreuzungspunkt mit der ersten Befestigungsstruktur (11) mit einer Verstärkungsrippe (2313) versehen ist.

2. In eine Zimmerdecke eingebettete Klimaanlage nach Anspruch 1, wobei mehrere erste Befestigungsstrukturen (11) bereitgestellt sind, wobei die mehreren ersten Befestigungsstrukturen (11) rings um die äußere Hülle (10) angeordnet sind und mehrere zweite Befestigungsstrukturen (231), die den mehreren ersten Befestigungsstrukturen (11) eins zu eins entsprechen, rings um die Auffangwanne (20) angeordnet sind.

3. In eine Zimmerdecke eingebettete Klimaanlage nach Anspruch 1 oder 2, wobei die erste Befestigungsstruktur (11) ein Platte ist und die erste Befestigungsstruktur (11) Folgendes umfasst:

einen Anbauabschnitt (111), der an eine äußere umlaufende Fläche der äußeren Hülle (10) angeschlossen ist,

einen sich quer erstreckender Abschnitt (112),

- der sich von einer Unterseite des Anbauabschnitts (111) in einer Richtung weg von der äußeren Hülle (10) erstreckt, wobei die erste Montageöffnung (1121) an dem sich quer erstreckenden Abschnitt (112) angeordnet ist, und einen sich vertikal erstreckenden Abschnitt (113), der sich von einer Seite des sich quer erstreckenden Abschnitts (112) weg von dem Anbauabschnitt (111) nach unten erstreckt, wobei eine horizontale Breite des sich vertikal erstreckenden Abschnitts (113) kleiner als eine horizontale Breite des sich quer erstreckenden Abschnitts (112) ist und ein Teilbereich, um den der sich vertikal erstreckende Abschnitt (113) kürzer als der sich quer erstreckende Abschnitt (112) ist, die Vorbefestigungsrinne (114) bildet, wobei die zweite Befestigungsstruktur (231) an einer Unterseite des sich quer erstreckenden Abschnitts (112) angebaut ist, der Vorbefestigungshaken (2312) an die Vorbefestigungsrinne (114) geklemmt ist und der sich vertikal erstreckende Abschnitt (113) an eine Seite der zweiten Befestigungsstruktur (231), weg von der äußeren Hülle (10), geklemmt ist.
4. In eine Zimmerdecke eingebettete Klimaanlage nach Anspruch 3, wobei der Vorbefestigungshaken (2312) an einer Seite, hin zu dem sich quer erstreckenden Abschnitt (112), mit einer Führungsfläche (2314) versehen ist.
5. In eine Zimmerdecke eingebettete Klimaanlage nach Anspruch 3 oder 4, wobei eine Oberseite des sich quer erstreckenden Abschnitts (112) mit einem konvexen Rand (1122) versehen ist, der die erste Montageöffnung (1121) umgibt, und der konvexe Rand (1122) durch Prägen integral an dem sich quer erstreckenden Abschnitt (112) gebildet ist.
6. In eine Zimmerdecke eingebettete Klimaanlage nach einem der Ansprüche 1 bis 5, wobei eine Innenseite der äußeren Hülle (10) mit einer isolierenden Hülle (30) mit der gleichen Form wie die äußere Hülle (10) versehen ist und die Auffangwanne (20) an eine Unterseite der isolierenden Hülle (30) angeschlossen ist.
7. In eine Zimmerdecke eingebettete Klimaanlage nach Anspruch 6, wobei die Auffangwanne (20) Folgendes umfasst:
- eine zentrale Wanne (21), die unter einem Verdampfer der in eine Zimmerdecke eingebetteten Klimaanlage (100) angeordnet ist, mehrere umlaufend angeschlossene Teilbereiche (23), die an einer Außenseite der zentralen Wanne (21) umlaufend beabstandet sind, wobei die mehreren umlaufend angeschlossenen Teilbereiche (23) unter der isolierenden Hülle (30) angeschlossen sind und an eine innen umlaufende Fläche der äußeren Hülle (10) angeschlossen sind, und mehrere Anschlussstellbereiche (22), die jeweils zwischen der zentralen Wanne (21) und den umlaufend angeschlossenen Teilbereichen (23) angeschlossen sind, wobei jeder der umlaufend angeschlossenen Teilbereiche (23) mit der zweiten Befestigungsstruktur (231) versehen ist.
8. In eine Zimmerdecke eingebettete Klimaanlage nach Anspruch 7, wobei an einer umlaufenden Wand der isolierenden Hülle (30) mehrere Verbindungsstellen (31) bereitgestellt sind, wobei jede der Verbindungsstellen (31) nach unten offen ist und mindestens ein Teil von oberen Flächen der Verbindungsstellen (31) bogenförmige Flächen sind, wobei die umlaufend angeschlossenen Teilbereiche (23) in die Verbindungsstellen (31) eingepasst sind und die oberen Flächen der umlaufend angeschlossenen Teilbereiche (23) eng in die oberen Flächen der Verbindungsstellen (31) eingepasst sind.
9. In eine Zimmerdecke eingebettete Klimaanlage nach Anspruch 7 oder 8, wobei obere Flächen der umlaufend angeschlossenen Teilbereiche (23) an jedem der zwei umlaufenden Enden eine nach unten gekrümmte bogenförmige Fläche (232) bilden.

Revendications

1. Climatiseur encastré dans le plafond (100), comportant :

une coque extérieure (10), une cavité de réception (101) qui est mise en oeuvre dans la coque extérieure (10), une partie inférieure de la coque extérieure (10) qui est ouverte, un côté circonférentiel extérieur de la coque extérieure (10) qui est relié à une première structure de fixation (11) ; et

un bac d'évacuation (20) adapté au niveau de la partie inférieure de la coque extérieure (10), un côté circonférentiel extérieur du bac d'évacuation (20) qui est doté d'une deuxième structure de fixation (231) reliée à la première structure de fixation (11), dans lequel

un premier trou de montage (1121) et une rainure de préfixation (114) sont mis en oeuvre sur la première structure de fixation (11), un deuxième trou de montage (2311) et un crochet de préfixation (2312) sont mis en oeuvre sur la deuxième structure de fixation (231), et quand le crochet de préfixation (2312) est serré dans la rainure de préfixation (114), le premier trou

de montage (1121) est aligné sur le deuxième trou de montage (2311) ;

caractérisé en ce que le bac d'évacuation (20) est doté d'une nervure de renfort (2313) au niveau d'une jonction avec la première structure de fixation (11).

2. Climatiseur encastré dans le plafond selon la revendication 1, dans lequel les premières structures de fixation d'une pluralité de premières structures de fixation (11) sont mises en oeuvre, les premières structures de fixation de la pluralité de premières structures de fixation (11) sont disposées autour de la coque extérieure (10), et les deuxièmes structures de fixation d'une pluralité de deuxièmes structures de fixation (231) correspondant respectivement aux premières structures de fixation de la pluralité de premières structures de fixation (11) de manière univoque sont disposées autour du bac d'évacuation (20).
3. Climatiseur encastré dans le plafond selon les revendications 1 ou 2, dans lequel la première structure de fixation (11) est une plaque, et la première structure de fixation (11) comporte :

une section d'adaptation (111) reliée sur une surface circonférentielle extérieure de la coque extérieure (10) ;

une section d'extension transversale (112) s'étendant depuis une partie inférieure de la section d'adaptation (111) dans une direction allant à l'opposé de la coque extérieure (10), le premier trou de montage (1121) étant disposé sur la section d'extension transversale (112) ; et une section d'extension verticale (113) s'étendant vers le bas depuis un côté de la section d'extension transversale (112) à l'opposé de la section d'adaptation (111), dans lequel une largeur horizontale de la section d'extension verticale (113) est inférieure à une largeur horizontale de la section d'extension transversale (112), et une partie selon laquelle la section d'extension verticale (113) est plus courte que la section d'extension transversale (112) constitue la rainure de préfixation (114),

dans lequel la deuxième structure de fixation (231) est adaptée au niveau d'une partie inférieure de la section d'extension transversale (112), le crochet de préfixation (2312) est serré au niveau de la rainure de préfixation (114), et la section d'extension verticale (113) est serrée sur un côté de la deuxième structure de fixation (231) à l'opposé de la coque extérieure (10).

4. Climatiseur encastré dans le plafond selon la revendication 3, dans lequel le crochet de préfixation (2312) est doté d'une surface de guidage (2314) sur un côté vers la section d'extension transversale

(112).

5. Climatiseur encastré dans le plafond selon la revendication 3 ou la revendication 4, dans lequel une surface supérieure de la section d'extension transversale (112) est dotée d'un bord convexe (1122) qui entoure le premier trou de montage (1121), et le bord convexe (1122) est formé d'un seul tenant sur la section d'extension transversale (112) par estampage.
6. Climatiseur encastré dans le plafond selon l'une quelconque des revendications 1 à 5, dans lequel un côté intérieur de la coque extérieure (10) est doté d'une coque isolante (30) ayant la même forme que la coque extérieure (10), et le bac d'évacuation (20) est relié au niveau d'une partie inférieure de la coque isolante (30).
7. Climatiseur encastré dans le plafond selon la revendication 6, dans lequel le bac d'évacuation (20) comporte :

un bac central (21) disposé sous un évaporateur du climatiseur encastré dans le plafond (100) ; une pluralité de parties (23) reliées dans le sens de la circonférence espacées dans le sens de la circonférence sur un côté extérieur du bac central (21), les parties de la pluralité de parties (23) reliées dans le sens de la circonférence étant reliées sous la coque isolante (30) et reliées sur une surface circonférentielle intérieure de la coque extérieure (10) ; et une pluralité de parties de liaison (22) reliées chacune entre le bac central (21) et les parties (23) reliées dans le sens de la circonférence, dans lequel chacune des parties (23) reliées dans le sens de la circonférence est dotée de la deuxième structure de fixation (231).

8. Climatiseur encastré dans le plafond selon la revendication 7, dans lequel les joints d'une pluralité de joints (31) sont mis en oeuvre sur une paroi circonférentielle de la coque isolante (30), chacun des joints (31) est ouvert vers le bas, et au moins une partie des surfaces supérieures des joints (31) sont des surfaces en forme d'arc, les parties (23) reliées dans le sens de la circonférence sont adaptées dans les joints (31), et les surfaces supérieures des parties (23) reliées dans le sens de la circonférence sont étroitement adaptées par rapport aux surfaces supérieures des joints (31).
9. Climatiseur encastré dans le plafond selon la revendication 7 ou la revendication 8, dans lequel les surfaces supérieures des parties (23) reliées dans le sens de la circonférence forment une surface (232) en forme d'arc incurvée vers le bas au niveau de chacune de deux extrémités circonférentielle.

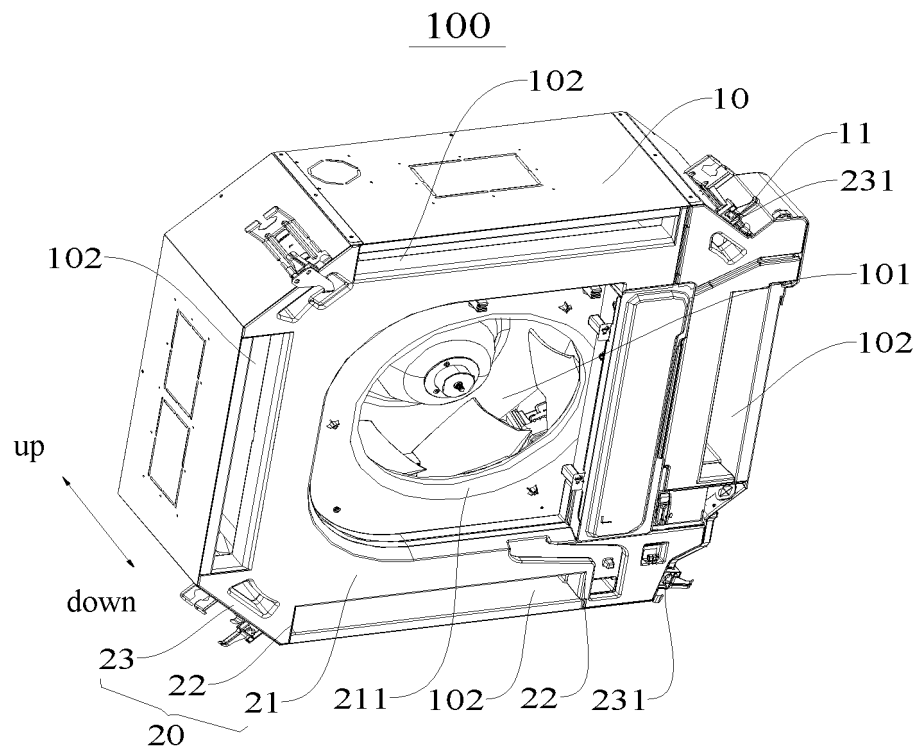


Fig. 1

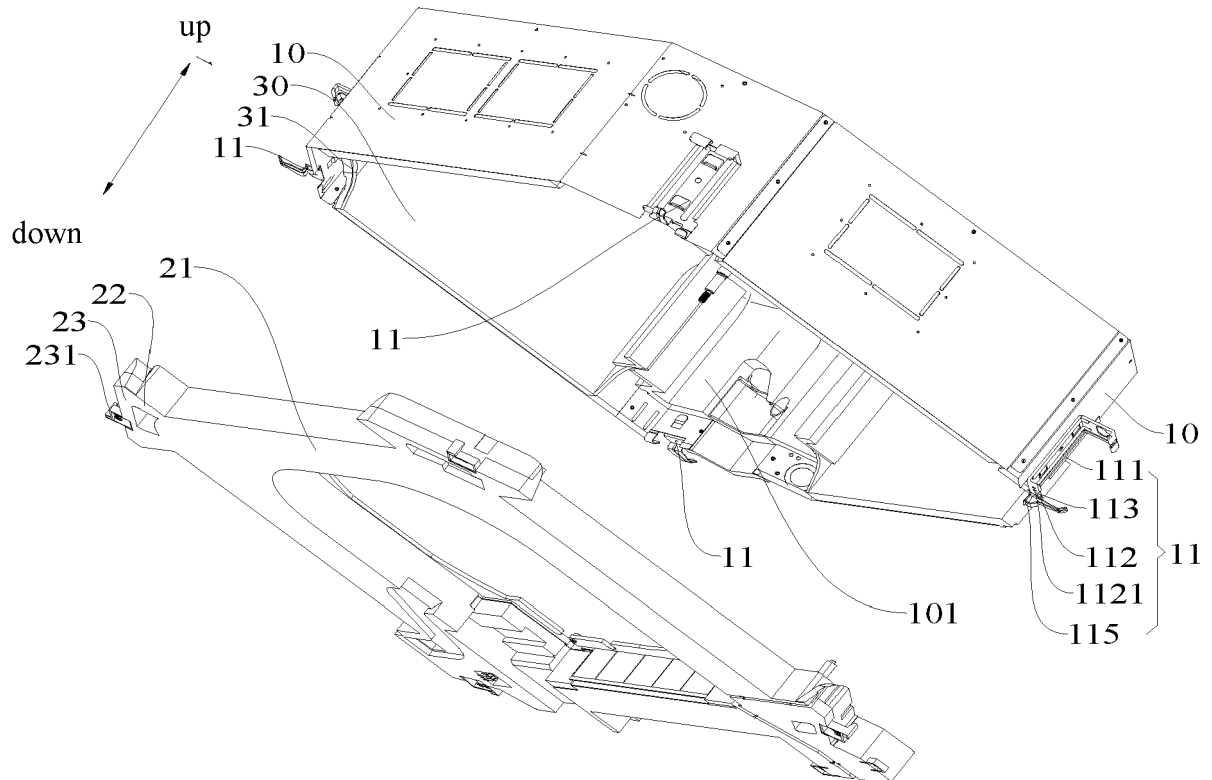


Fig. 2

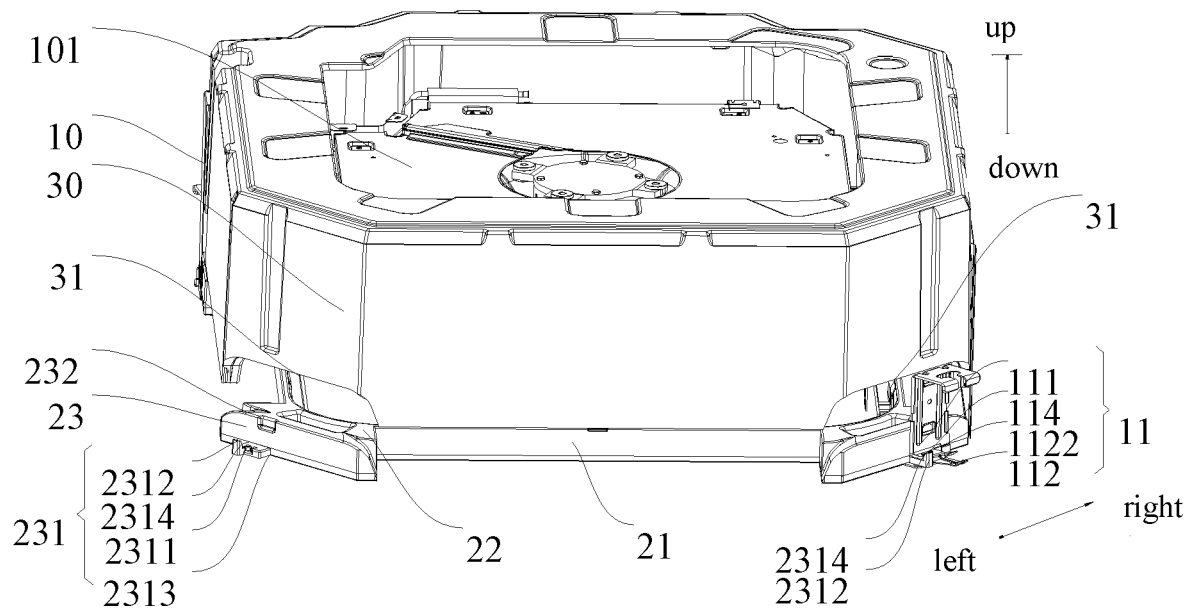


Fig. 3

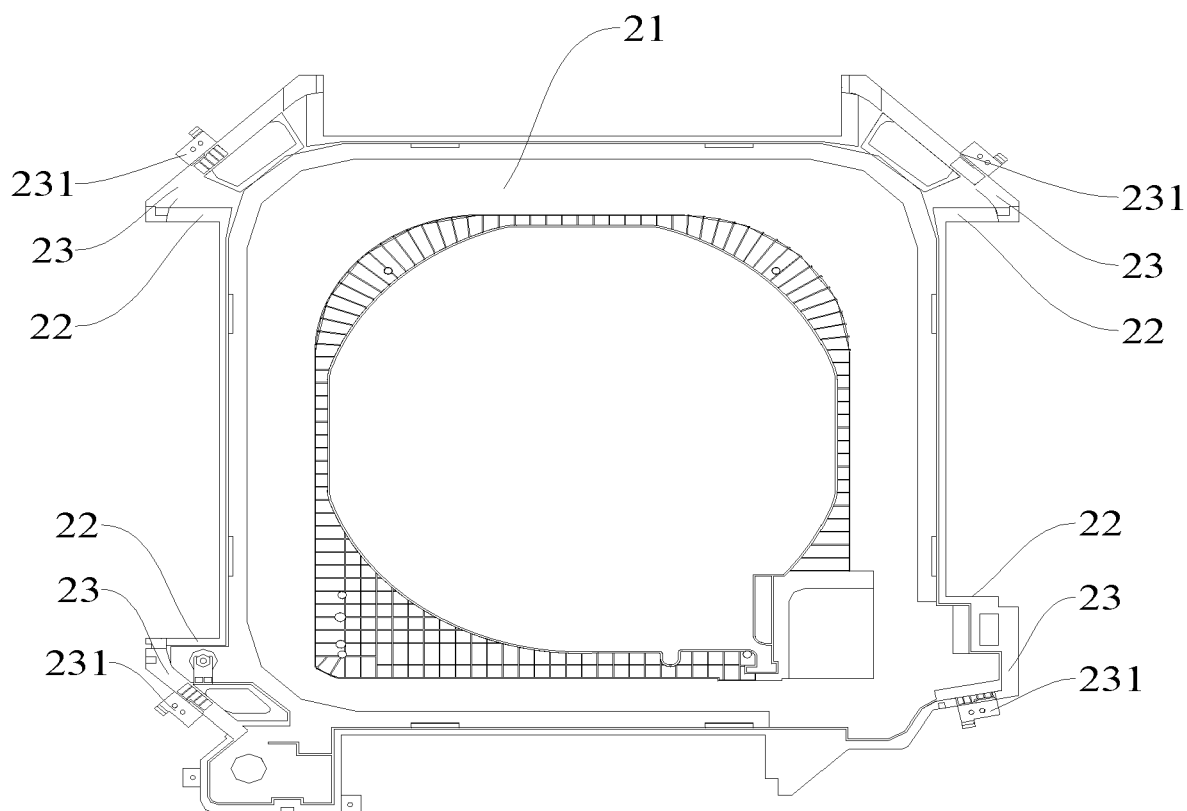


Fig. 4

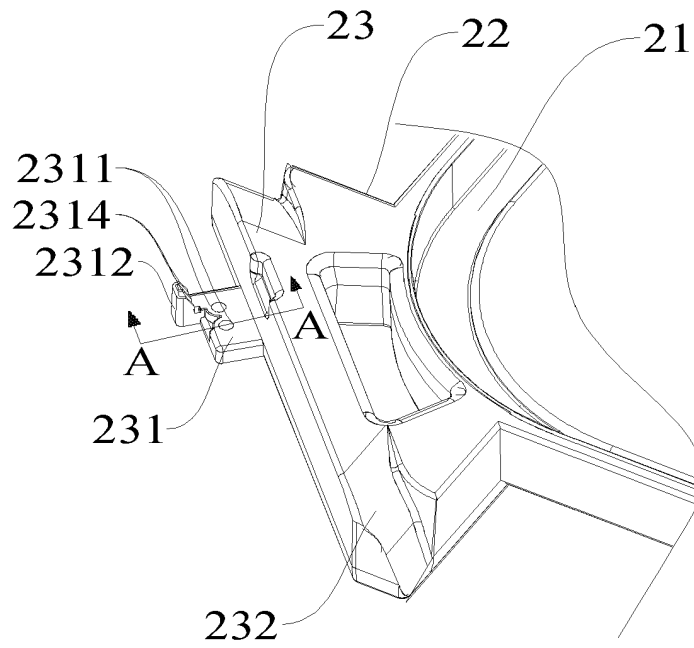


Fig. 5

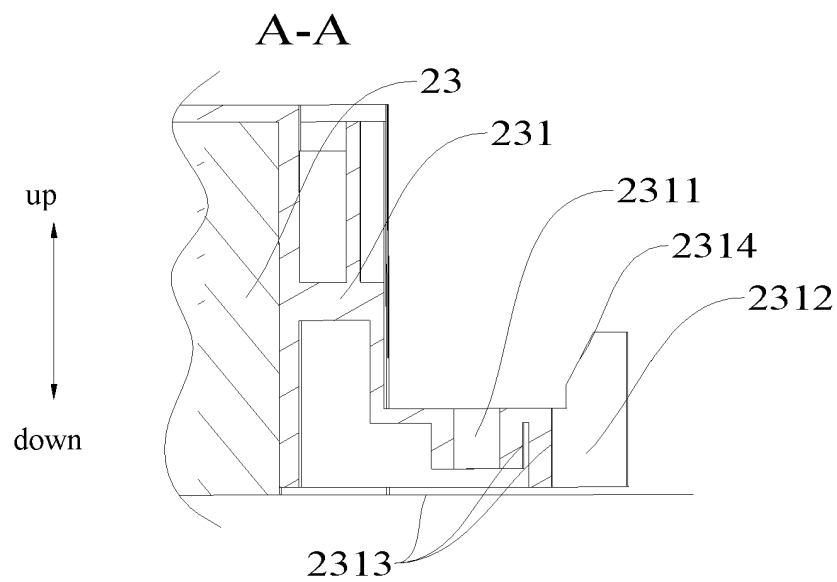


Fig. 6

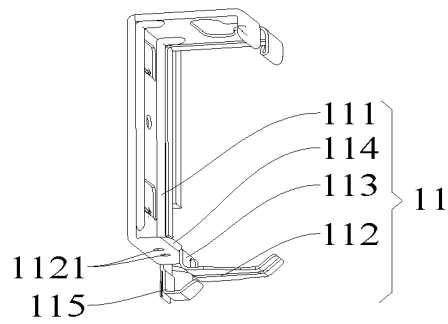


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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