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(54) **AIR CONDITIONER FRAME STRUCTURE, FUNCTIONAL BRACKET, FUNCTIONAL ASSEMBLY, AND AIR CONDITIONER**

(57) The present invention relates to a functional bracket (3), an air conditioner frame structure, a functional assembly and an air conditioner, and relates to the field of electrical appliances. The functional bracket (3) includes a bearing portion (31) configured to bear a functional module (4); and a connection portion (32). The connection portion (32) has a first end connected

to the bearing portion (31), and a second end configured to be connected to a middle frame (1). The air conditioner frame structure includes the middle frame (1) and the functional bracket (3), the functional bracket (3) is arranged on the middle frame (1), and the functional bracket (3) is configured to mount the functional module (4).

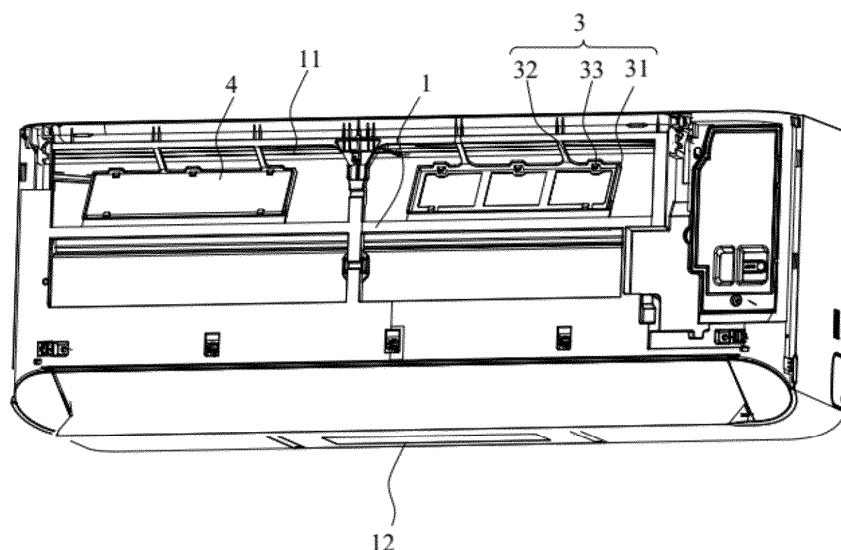


FIG. 1

EP 4 826 303 A1

Description

FIELD

[0001] The present invention relates to the field of electrical appliances, and in particular to an air conditioner frame structure, a functional bracket, a functional assembly, and an air conditioner.

BACKGROUND

[0002] Existing air conditioners only have cooling and heating capabilities, but with the improvement of quality of life, people have higher requirements for the functions that the air conditioners may provide, such as, mosquito repellent, fragrance, formaldehyde removal, organic matter removal, IFD filter, humidification, etc.

SUMMARY

[0003] The present invention provides a functional bracket, a functional assembly, and an air conditioner, which facilitates replacement of a functional module and improves structural strength.

[0004] According to a first aspect of the present invention, there is provided an air conditioning frame structure including:

a middle frame; and
a functional bracket arranged on the middle frame, in which the functional bracket is configured to mount a functional module.

[0005] According to a second aspect of the present invention, there is provided an air conditioning frame structure including:

a middle frame provided with an opening;
a face cover connected to the middle frame and selectively covering the opening; and
a functional bracket arranged on the middle frame and facing the opening, in which the functional bracket is configured to mount a functional module.

[0006] Optionally, the middle frame has an air inlet and an air outlet, and the functional bracket is arranged on a side of the middle frame facing the air inlet.

[0007] Optionally, the functional bracket includes:

a bearing portion configured to bear the functional module; and
a connection portion located between the middle frame and the bearing portion, in which the bearing portion is connected to the middle frame through the connection portion.

[0008] Optionally, at least part of the middle frame, the connection portion, and the bearing portion are in-

tegrally formed; or

at least one of the middle frame and the bearing portion is detachably connected to the connection portion.

[0009] Optionally, a plurality of connection portions are provided, the plurality of connection portions are arranged around the bearing portion, and a hollow portion is formed between two adjacent connection portions.

[0010] Optionally, the bearing portion has a first side edge and a second side edge connected to each other, a first gap is formed between the first side edge and the middle frame correspondingly connected to the first side edge, a second gap is formed between the second side edge and the middle frame correspondingly connected to the second side edge, and a width of the first gap in a first direction is larger than a width of the second gap in the first direction;

a length of the connection portion located in the first gap in a second direction is smaller than a length of the connection portion located in the second gap in the second direction; and
the first direction and the second direction are perpendicular to each other, the first direction is a width direction of the bearing portion, and the second direction is a length direction of the bearing portion.

[0011] Optionally, the bearing portion has a mounting groove, and the mounting groove is configured to mount the functional module; and
the mounting groove includes a groove bottom and a groove wall, the groove wall is arranged on the groove bottom and arranged around the groove bottom, and the groove wall is configured for circumferential limit of the functional module.

[0012] Optionally, the bearing portion has a ventilation hole.

[0013] Optionally, the functional bracket further includes:

a limiting portion arranged on a side of the bearing portion away from the connection portion, in which the limiting portion extends toward the mounting groove, and the limiting portion is configured to limit the functional module such that the functional module is located between the limiting portion and the bearing portion.

[0014] According to a third aspect of the present invention, there is provided a functional bracket including:

a bearing portion configured to bear a functional module; and
a connection portion, in which the connection portion has a first end connected to the bearing portion, and a second end configured to be connected to the middle frame.

[0015] Optionally, the bearing portion has a mounting

groove, and the mounting groove is configured to mount the functional module; and the mounting groove includes a groove bottom and a groove wall, the groove wall is arranged on the groove bottom and arranged around the groove bottom, and the groove wall is configured for circumferential limit of the functional module.

[0016] Optionally, the bearing portion has a ventilation hole.

[0017] Optionally, the connection portion and the bearing portion are integrally formed; or the bearing portion is detachably connected to the connection portion.

[0018] Optionally, a plurality of connection portions are provided, the plurality of connection portions are arranged around the bearing portion, and a hollow portion is formed between two adjacent connection portions.

[0019] Optionally, the functional bracket further includes:

a limiting portion arranged on a side of the bearing portion away from the connection portion, in which the limiting portion extends toward the mounting groove, and the limiting portion is configured to limit the functional module such that the functional module is located between the limiting portion and the bearing portion.

[0020] According to a fourth aspect of the present invention, there is provided a functional assembly including a functional module and the functional bracket described above, and the functional module is detachably connected to the functional bracket.

[0021] Optionally, the functional bracket includes: a bearing portion, in which the functional module is arranged on the bearing portion, and a bottom surface of the functional module in a third direction is in contact with the bearing portion.

[0022] Optionally, the bearing portion has a mounting groove, the functional module is arranged in the mounting groove, and the functional module has a peripheral surface around the third direction; and the mounting groove includes a groove bottom and a groove wall, the groove wall is arranged on the groove bottom and arranged around the groove bottom, and the groove wall is capable of abutting against the peripheral surface.

[0023] Optionally, the functional bracket further includes:

a limiting portion arranged on the bearing portion and extending toward the mounting groove, in which the functional module is located between the limiting portion and the bearing portion.

[0024] Optionally, the limiting portion is capable of snapping onto the functional module.

[0025] Optionally, the functional module includes at least one of a mosquito repellent portion, a fragrance portion, a formaldehyde removal portion, an organic matter removal portion, an IFD filter portion, and a humidification portion.

[0026] According to a fifth aspect of the present disclosure, there is provided an air conditioner including the air conditioner frame structure described above.

[0027] Optionally, the air conditioner further includes a functional module, and the functional module is detachably connected to the functional bracket of the air conditioner frame structure.

[0028] Optionally, the air conditioner further includes an evaporator, the evaporator is located in the middle frame, the middle frame has an air inlet and an air outlet, and the evaporator is located between the air inlet and the air outlet, such that air introduced from the air inlet passes through the functional module and the evaporator and is discharged through the air outlet; and

an air inlet portion is arranged on a side of the evaporator facing the functional module, the air inlet portion is inclined relative to the middle frame, and the functional bracket is arranged parallel to and directly opposite the air inlet portion.

[0029] In the air conditioner frame structure and the air conditioner provided by the present invention, the functional bracket is arranged in the middle frame, and the functional bracket serves as a reinforcing rib to reinforce the structure of the middle frame, improving the overall structural strength of the middle frame.

[0030] In the air conditioner frame structure provided by the present invention, the functional bracket is arranged in the middle frame, and when the functional module needs to be replaced, the functional module may be replaced from the functional bracket only by opening the face cover without disassembling the filter screen assembly, reducing operation steps and improving operation convenience. At the same time, the functional bracket is arranged toward the opening, which is convenient for a user or an after-sale service to take out the functional module located on the functional bracket through the opening, and improves the high efficiency of replacing the functional module.

[0031] In the functional bracket provided by the present invention, the bearing portion provides a mounting position for the functional module, the bearing portion is configured to bear the functional module, and the bearing portion provides a certain supporting force for the functional module, the functional module is not stressed after being mounted, thus having good mounting reliability. Even if the functional module is loosely mounted, the functional module will be limited to the bearing portion and will not fall on other components in the air conditioner, reducing quality risks such as heat exchange and water leakage. In addition, the bearing portion is connected to the middle frame through the connection portion, and the connection portion plays the role of intermediate connection, such that the bearing portion and the middle frame form an integral structure, and the bearing portion and the connection portion also play the role of strengthening the middle frame to a certain extent, to improve the structural strength of the middle frame.

[0032] In the functional assembly provided by the present invention, the functional bracket provides a mounting position for the functional module, the functional module is not completely fixed on the functional bracket, the functional module is detachably connected to the functional bracket, and the user or the after-sale service may mount and disassemble the functional module according to the actual use needs, which is free and flexible.

[0033] It should be understood that, the forgoing general description and the detailed description hereinafter are only illustrative and explanatory, and cannot limit the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0034] The accompanying drawings herein are incorporated into the specification and constitute a part of the specification. These accompanying drawings illustrate embodiments conform to the present invention and are used to explain the principles of the present invention together with the specification. Obviously, the accompanying drawings described below show some embodiments of the present invention, and those skilled in the art can obtain other drawings based on these drawings without paying creative efforts.

FIG. 1 is a schematic structural diagram of an air conditioner frame structure provided in a first embodiment of the present invention after a functional module is mounted.

FIG. 2 is a schematic structural diagram of the air conditioner frame structure provided in a first embodiment of the present invention without a functional module mounted.

FIG. 3 is a partial enlarged view of portion A in FIG. 2.

FIG. 4 is a partial enlarged view of portion B in FIG. 3.

FIG. 5 is a schematic structural diagram of an air conditioner provided in a first embodiment of the present invention.

FIG. 6 is a cross-sectional view taken along line E-E in FIG. 5.

FIG. 7 is a schematic structural diagram of an air conditioner frame structure provided in a second embodiment of the present invention in a state in which a face cover is closed.

FIG. 8 is a schematic structural diagram of an air conditioner frame structure provided in a second embodiment of the present invention in a state in which a face cover is opened.

FIG. 9 is a schematic structural diagram of a functional assembly provided in a fourth embodiment of the present invention.

FIG. 10 is a schematic structural diagram of a functional module in a functional assembly provided in a fourth embodiment of the present invention.

FIG. 11 is a partial enlarged view of portion C in FIG. 9.

FIG. 12 is a partial enlarged view of portion D in FIG. 9.

[0035] Reference numerals:

1, middle frame; 2, face cover; 3, functional bracket; 4, functional module; 5, evaporator; 6, fan; 10, opening; 11, air inlet; 12, air outlet; 31, bearing portion; 310, mounting groove; 3101, groove bottom; 3102, groove wall; 311, first side edge; 312, second side edge; 313, ventilation hole; 32, connection portion; 320, hollow portion; 33, limiting portion; 34, first gap; 35, second gap; 40, peripheral surface; 41, top surface; 42, bottom surface; 50, air inlet portion.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0036] Example implementations will not be described in detail below with reference to the accompanying drawings. However, the example implementations may be implemented in many forms and should not be construed as limited to the implementations set forth here; rather, these implementations are provided such that the present invention will be comprehensive and complete, and the concept of the example implementations will be fully conveyed to those skilled in the art. Like reference numerals in the drawings denote the same or similar structures, and thus detailed description will be omitted. Furthermore, the drawings are merely schematic illustrations of the present invention and are not necessarily drawn to scale.

[0037] The terms "a," "an," "this," "the," and "at least one" are used to indicate the presence of one or more elements/components/etc.; the terms "including" and "having" are used to mean an open inclusive meaning and mean that additional elements/components/etc. may be present in addition to those listed elements/components/etc.; the terms "first" and "second" are used only as labels and are not limiting the number of objects.

Embodiment 1

[0038] As illustrated in FIGS. 1-2, the present embodiment provides an air conditioner frame structure, which is suitable for the field of air conditioning. As illustrated in FIG. 1, the air conditioner frame structure includes a middle frame 1 and a functional bracket 3, the functional bracket 3 is arranged in the middle frame 1, and the functional bracket 3 is configured to mount the functional module 4.

[0039] By way of example, the middle frame 1 is similar to a rectangular parallelepiped structure, with neat appearance and good aesthetics; the middle

frame 1 is a frame structure, and the middle frame 1 may provide a mounting position for other components of the air conditioner and provide a certain supporting force. When the middle frame 1 is manufactured, it is affected by a mold factor. The middle frame 1 is generally a hollow structure. Although the structural strength is relatively poor, it has the advantage of light weight and may meet the lightweight needs of the user.

[0040] In the air conditioner frame structure provided by the present embodiment, the functional bracket 3 is arranged in the middle frame 1, and the functional bracket 3 serves as a reinforcing rib to reinforce the structure of the middle frame 1, improving the overall structural strength of the middle frame 1 without affecting the thickness of the whole machine.

[0041] By way of example, an outer shape of the functional bracket 3 is similar to a rectangular frame structure, and the functional module 4 may not be mounted on the functional bracket 3, or the functional module 4 may also be mounted on the functional bracket 3. A shape of the functional bracket 3 is adapted to an outer shape of the functional module 4. Optionally, the functional module 4 may have a component with an expansion function, and the functional module 4 has a certain expansion function, that is, different air purification or environment optimization functions, such as mosquito repellent function, fragrance function, air cleaning function, humidification function, etc., such that the air conditioner may discharge an airflow with a certain expansion function when blowing the air, to meet the diversified use needs of the user.

[0042] By way of example, a plurality of functional brackets 3 may be provided, and the plurality of functional brackets 3 are arranged on the middle frame 1, for example, two functional brackets 3 are provided, and the two functional brackets 3 are arranged in parallel intervals on the middle frame 1, which may further increase the structural strength of the middle frame 1. It could be understood that one functional module 4 may be provided, and the one functional module 4 is mounted on any one of the functional brackets 3. Two functional modules 4 may be provided, the two functional modules 4 are respectively mounted on the two functional brackets 3, and the expansion functions of the two functional modules 4 may be the same to increase the efficacy of the expansion functions; or the expansion functions of the two functional modules 4 may be different, and different expansion functions may be implemented simultaneously.

[0043] As illustrated in FIGS. 1-2, the middle frame 1 has an air inlet 11 and an air outlet 12, the functional bracket 3 is located between the air inlet 11 and the air outlet 12, the external air enters the middle frame 1 through the air inlet 11, and after the air passes through the functional module 4 located on the functional bracket 3, an airflow with a certain expansion function is formed, and finally is discharged from the air outlet 12.

[0044] The functional bracket 3 is arranged on a side

of the middle frame 1 facing the air inlet 11, that is, the functional bracket 3 is arranged close to the air inlet 11, such that a distance between the functional bracket 3 and the air inlet 11 is relatively small, and the air entering from the air inlet 11 may quickly pass through the functional module 4 located on the functional bracket 3, shortening the airflow path. At the same time, after the functional module 4 is mounted on the functional bracket 3, the functional module 4 can receive air to the greatest extent, ensure that as much air as possible passes through the functional module 4, and reduce the situation that air dispersion affects the air outlet efficiency. In addition, because the air resistance of the functional module 4 is relatively large, the functional bracket 3 is arranged in the middle frame 1, and the functional module 4 will not be blocked in the air inlet 11 due to long-term dust accumulation, which has a relatively small influence on the airflow and will not affect the air inlet area, increasing the outlet airflow and facilitating the heat exchange.

[0045] It could be understood that in some other embodiments, the functional bracket 3 may be further close to the air inlet 11, for example, the functional bracket 3 may be arranged directly at the air inlet 11. After the functional module 4 is mounted on the functional bracket 3, the air entering from the air inlet 11 may directly pass through the functional module 4, which may shorten the air flow path and reduce the air flow dispersion, improving the air outlet efficiency of the expansion function airflow.

[0046] If the functional module is buckled on a filter screen assembly or hung on the functional bracket or middle frame, the functional module will fall off due to long-term stress. When the functional module falls on other components such as an evaporator, it will affect the heat exchange of the air conditioner or cause quality problems such as water leakage.

[0047] To this end, as illustrated in FIGS. 2-3, the functional bracket 3 includes a bearing portion 31 and a connection portion 32, the bearing portion 31 is configured to bear the functional module 4, the connection portion 32 is located between the middle frame 1 and the bearing portion 31, and the bearing portion 31 is connected to the middle frame 1 through the connection portion 32.

[0048] In the functional bracket 3 provided in the present embodiment, the bearing portion 31 provides a mounting position for the functional module 4, the bearing portion 31 is configured to bear the functional module 4, and the bearing portion 31 provides a certain supporting force for the functional module 4, the functional module 4 is not stressed after being mounted, thus having good mounting reliability. Even if the functional module 4 is loosely mounted, the functional module 4 will be limited to the bearing portion 31 and will not fall on other components in the air conditioner, reducing quality risks such as heat exchange and water leakage. In addition, the bearing portion 31 is con-

nected to the middle frame 1 through the connection portion 32, and the connection portion 32 plays the role of intermediate connection, such that the bearing portion 31 and the middle frame 1 form an integral structure, and the bearing portion 31 and the connection portion 32 also play the role of strengthening the middle frame 1 to a certain extent, to improve the structural strength of the middle frame 1.

[0049] There may be a plurality of connection modes between the functional bracket 3 and the middle frame 1, and for example, at least part of the middle frame 1, the connection portion 32, and the bearing portion 31 are integrally formed, for example, the middle frame 1, the connection portion 32, and the bearing portion 31 are integrally formed, which reduces the links of parts assembly and saves production costs. By way of example, at least one of the middle frame 1 and the bearing portion 31 is detachably connected to the connection portion 32, for example, the connection portion 32 has a first end detachably connected to the middle frame 1, and a second end detachably connected to the bearing portion 31, and the middle frame 1, the connection portion 32, and the bearing portion 31 have a split structure, which is convenient to mount and disassemble, and is convenient for subsequent maintenance and replacement. In the present embodiment, the functional bracket 3 and the middle frame 1 are integrally formed as an example.

[0050] Individual structures of the bearing portion 31 and the connection portion 32 will be described in detail below.

[0051] As illustrated in FIGS. 3 to 4, the outer shape of the bearing portion 31 is similar to a rectangular structure, and a width direction of the bearing portion 31 is defined as a first direction, the first direction is identified by D1, a length direction of the bearing portion 31 is a second direction, the second direction is identified by D2, a height direction of the bearing portion 31 is a third direction, and the third direction is identified by D3, in which the first direction, the second direction, and the third direction are perpendicular to each other in pairs, and the first direction, the second direction, and the third direction only represent the spatial direction and have no substantial significance.

[0052] By way of example, the bearing portion 31 has a mounting groove 310, the mounting groove 310 is configured to mount the functional module 4, and the mounting groove 310 provides a mounting position and an accommodation space for the functional module 4. Specifically, the mounting groove 310 may optionally be a rectangular groove, the outer shape of the functional module 4 is similar to a rectangular parallelepiped structure, and the inner wall of the mounting groove 310 is adapted to the outer wall contour of the functional module 4.

[0053] In the third direction, a groove depth of the mounting groove 310 is larger than the thickness of the functional module 4, and the functional module 4 may

be at least partially embedded in the mounting groove 310, reducing the protrusion of the functional module 4 from the bearing portion 31. Alternatively, in the third direction, the groove depth of the mounting groove 310 is equal to the thickness of the functional module 4, and when the functional module 4 is placed in the mounting groove 310, the functional module 4 and the bearing portion 31 are arranged approximately flush, resulting in relatively good aesthetic appearance.

[0054] Specifically, as illustrated in FIGS. 3 to 4, the mounting groove 310 includes a groove bottom 3101 and a groove wall 3102, the groove wall 3102 is arranged on the groove bottom 3101 and arranged around the groove bottom 3101, the groove bottom 3101 provides a certain supporting force for the functional module 4, and the groove wall 3102 is configured for circumferential limit of the functional module 4, which reduces the position deviation of the functional module 4 in the first direction and/or the second direction, and improves the mounting stability of the functional module 4.

[0055] If the external air introduced from the air inlet 11 passes through the functional module 4, overflows from a same side or around the functional module 4 and is discharged to the air outlet 12, the airflow path has a zigzag line structure, and the airflow path is relatively long.

[0056] For this purpose, the bearing portion 31 has a ventilation hole 313, and by way of example, the ventilation hole 313 may have an optional through hole structure, for example, the ventilation hole 313 is a rectangular through hole.

[0057] In this way, when the external air introduced from the air inlet 11 passes through the functional module 4, the external air enters from one side of the functional module 4 in the third direction and is discharged from the other side, and then is directly discharged through the ventilation hole 313, that is, an air inlet side and an air outlet side of the functional module 4 are located on two sides of the functional module 4 in the third direction, and the air entering the functional module 4 and the air discharged from the functional module 4 do not have airflow interference to ensure ventilation smoothness. At the same time, the airflow path is approximately linear, which reduces the degree of bending and improves the efficiency of airflow circulation.

[0058] By way of example, one ventilation hole 313 may be provided, and an area of the ventilation hole 313 is slightly smaller than an area of the bottom surface of the functional module 4 in the third direction, increasing an exposed area of the functional module 4 and improving ventilation smoothness; a plurality of ventilation holes 313 are arranged may be provided, and the plurality of ventilation holes 313 are arranged in the second direction, for example, three ventilation holes 313 are provided, and the three ventilation holes 313 are arranged in the second direction at intervals, while increasing the ventilation area, the portion of the

bearing portion 31 between two adjacent ventilation holes 313 may also provide a certain supporting force for the functional module 4 to ensure the mounting stability of the functional module 4.

[0059] In some illustrative embodiments 33, as illustrated in FIGS. 3 to 4, the functional bracket 3 further includes a limiting portion 33, and the limiting portion 33 is arranged on a side of the bearing portion 31 away from the connection portion 32 to avoid positional interference between the limiting portion 33 and the connection portion 32. The limiting portion 33 extends toward the mounting groove 310, and the limiting portion 33 is configured to limit the functional module 4 such that the functional module 4 is located between the limiting portion 33 and the bearing portion 31.

[0060] In this way, the bottom surface of the functional module 4 in the third direction is in contact with the bearing portion 31, and the top surface of the functional module 4 in the third direction may be blocked by the limiting portion 33. Under the joint action of the bearing portion 31 and the limiting portion 33, the front and rear limiting function of the functional module 4 in the third direction is realized, and the situation that the functional module 4 has a large positional deviation in the third direction is avoided.

[0061] By way of example, the limiting portion 33 may be welded, bolted to the bearing portion 31, or the limiting portion 33 and the bearing portion 31 may be integrally formed. Optionally, the limiting portion 33 may have a structure such as a limiting block, a limiting piece, a limiting arm, and a snap. For example, the limiting portion 33 is a limiting piece extending in the first direction, and the limiting piece and a side wall of the bearing portion 31 are arranged at an included angle. For example, the limiting piece and the side wall of the bearing portion 31 are perpendicular to each other, and are configured to fit with two adjacent right-angled sides of the functional module 4.

[0062] By way of example, a plurality of limiting portions 33 may be optionally provided, and the plurality of limiting portions 33 are located on at least one side of the bearing portion 31, for example, five limiting portions 33 are provided, three limiting portions 33 of the five limiting portions 33 are provided on one side of the bearing portion 31 in the first direction, and the other two limiting portions 33 are provided on the other side of the bearing portion 31 in the first direction. Of course, in some other embodiments, the plurality of limiting portions 33 may be symmetrically arranged on two sides of the bearing portion 31 in the first direction; and/or the plurality of limiting portions 33 may be symmetrically arranged on two sides of the bearing portion 31 in the second direction.

[0063] In another embodiment, the limiting portion 33 is capable of snapping onto the functional module 4, such that the bottom surface 42 of the functional module 4 in the third direction may abut against the bearing portion 31, and the top surface 41 of the functional

module 4 in the third direction may abut against the limiting portion 33, and the limiting portion 33 may realize the fixation of the functional module 4 while realizing the limiting of the functional module 4, improving the mounting stability of the functional module 4.

[0064] By way of example, there may be a plurality of snapping modes between the limiting portion 33 and the functional module 4, for example, one of the limiting portion 33 and the functional module 4 has a snap, the other has a slot corresponding to the snap, and the snap is snapped into the slot; or the limiting portion 33 is a limiting piece extending in the first direction, an included angle between the limiting piece and the side wall of the bearing portion 31 is an acute angle, and the limiting piece may abut against the top surface of the functional module 4 in the third direction.

[0065] By way of example, one end of the limiting portion 33 in the first direction and away from the bearing portion 31 may also have a chamfer or a guide inclined surface, and when the functional module 4 is mounted, the chamfer or the guide inclined surface may provide a certain guide force for the functional module 4, such that the functional module 4 may slide into the bearing portion 31 along the chamfer or the guide inclined surface, improving the mounting convenience.

[0066] As illustrated in FIGS. 3 to 4, the bearing portion 31 of the functional bracket 3 is connected to the middle frame 1 through the connection portion 32, and the connection portion 32 plays the role of an intermediate connection, such that the bearing portion 31 and the middle frame 1 form an integral structure.

[0067] By way of example, in some other embodiments, the connection portion 32 may also have an integral structure, and the connection portion 32 has an annular structure, such that each position in the circumferential direction of the bearing portion 31 may be connected to the middle frame 1 through the connection portion 32, and the connecting area is relatively large, improving the connection effect.

[0068] By way of example, the connection portion 32 may have a split structure, a plurality of connection portions 32 are provided, and the plurality of connection portions 32 are arranged on at least one side of the bearing portion 31, such that there are relatively numerous connection points between the functional bracket 3 and the middle frame 1, and the connection stability between the functional bracket 3 and the middle frame 1 is improved. The plurality of connection portions 32 may be arranged on two sides of the bearing portion 31 opposite to each other in the first direction and/or the second direction, or may be arranged on one or three sides of the bearing portion 31. The structural shapes of the plurality of connection portions 32 may be the same, different, or partially the same.

[0069] In some illustrative embodiments, the plurality of connection portions 32 are arranged around the bearing portion 31, and a hollow portion 320 is formed

between two adjacent connection portions 32 (as illustrated in FIG. 3).

[0070] By forming the hollow portion 320 between the two adjacent connection portions 32, the air resistance can be reduced, and the external air introduced from the air inlet 11 may be discharged through the hollow portion 320, reducing the risk that the connection portion 32 hinders the flow of airflow. Since the plurality of connection portions 32 are arranged around the bearing portion 31, the plurality of hollow portions 320 are also arranged around the bearing portion 31 to guide the air introduced from the air inlet 11 toward the bearing portion 31, and to a certain extent, play the role of airflow collection.

[0071] In some illustrative embodiments, as illustrated in FIG. 4, the bearing portion 31 has a first side edge 311 and a second side edge 312 connected to each other, a first gap 34 is formed between the first side edge 311 and the middle frame 1 correspondingly connected to the first side edge 311, a second gap 35 is formed between the second side edge 312 and the middle frame 1 correspondingly connected to the second side edge 312, and the width of the first gap 34 in the first direction is larger than the width of the second gap 35 in the first direction; the length of the connection portion 32 located in the first gap 34 in the second direction is smaller than the length of the connection portion 32 located in the second gap 35 in the second direction.

[0072] By way of example, the first side edge 311 and the second side edge 312 may be two opposite side edges of the bearing portion 31 in the first direction; the first side edge 311 and the second side edge 312 may also be two opposite side edges of the bearing portion 31 in the second direction; and the first side edge 311 and the second side edge 312 may also be two adjacent side edges of the bearing portion 31. In the present embodiment, for example, the first side edge 311 and the second side edge 312 are two opposite side edges of the bearing portion 31 in the first direction, and the first side edge 311 may be referred to as an upper side edge of the bearing portion 31, and the second side edge 312 may be referred to as a lower side edge of the bearing portion 31.

[0073] By way of example, the first gap 34 is substantially the distance between the first side edge 311 and the corresponding middle frame 1 in the first direction, and the second gap 35 is substantially the distance between the second side edge 312 and the corresponding middle frame 1 in the first direction.

[0074] If the width of the first gap 34 in the first direction is larger than the width of the second gap 35 in the first direction, which means that the distance between the first side edge 311 and the middle frame 1 is relatively large, the length of the connection portion 32 in the first gap 34 in the second direction is relatively small, and the connection portion 32 is similar to a cylindrical or rod-shaped structure, that is, the connection

between the first side edge 311 and the middle frame 1 is approximately point contact, and the connection area may be increased by increasing the number of connection portions 32. When the distance between the second side edge 312 and the middle frame 1 is relatively small, the length of the connection portion 32 located in the second gap 35 in the second direction is relatively large, and the connection portion 32 is similar to a strip-shaped structure, that is, the connection between the second side edge 312 and the middle frame 1 is approximately surface contact, which increases the connection area, and may also solve the problem that the first gap 34 is too small and it is inconvenient to provide the plurality of connection portions 32.

[0075] As illustrated in FIGS. 5 to 6, the present embodiment further provides an air conditioner including the air conditioner frame structure described above.

[0076] The air conditioner provided by the present embodiment includes the air conditioner frame structure, and the functional bracket 3 of the air conditioner frame structure is arranged in the middle frame 1, and the functional bracket 3 serves as a reinforcing rib to reinforce the structure of the middle frame 1, improving the overall structural strength of the middle frame 1.

[0077] In some illustrative embodiments, the air conditioner further includes a functional module 4, and the functional module 4 is detachably connected to the functional bracket 3 of the air conditioner frame structure. By way of example, the functional module 4 may optionally have a components with an expansion function, and the functional module 4 has a certain expansion function, such as a mosquito repellent function, a fragrance function, an air cleaning function, a humidification function, etc., such that the air conditioner may also realize the effect of air purification or environmental optimization when blowing the air, to meet the diversified use needs of the user.

[0078] In some illustrative embodiments, as illustrated in FIG. 6, the air conditioner further includes an evaporator 5, the evaporator 5 is located in the middle frame 1, the middle frame 1 has an air inlet 11 and an air outlet 12, and the evaporator 5 is located between the air inlet 11 and the air outlet 12, such that the external air introduced from the air inlet 11 passes through the functional module 4 and the evaporator 5 and is finally discharged through the air outlet 12.

[0079] Specifically, the external air introduced from the air inlet 11 forms an airflow with a certain expansion function after passing through the functional module 4. When the air conditioner is in the cooling state, the low-temperature and low-pressure liquid refrigerant enters the evaporator 5, and when the airflow of the expansion function comes into contact with the evaporator 5, the refrigerant and the airflow of the expansion function perform heat exchange, and the refrigerant absorbs the heat in the air and gradually evaporates into gas, realizing the cooling effect, and finally the airflow discharged from the air outlet 12 is the cold airflow with

the expansion function.

[0080] An air inlet portion 50 is arranged on a side of the evaporator 5 facing the functional module 4, that is, the air inlet portion 50 is located at a top position of the evaporator 5. The air inlet portion 50 is inclined relative to the middle frame 1, that is, the air inlet portion 50 has an inclined surface, and under the guiding action of the inclined surface, the condensed water formed when cold may flow downward along the inclined surface, and finally may be collected in the water accumulation pan located at the bottom of the evaporator 5.

[0081] The functional bracket 3 is arranged parallel to and directly opposite the air inlet portion 50, that is, the functional bracket 3 is in a parallel state with the evaporator 5, increasing the heat exchange area, shortening the airflow flow path, enabling the airflow to efficiently pass through the functional module 4 and the functional bracket 3, and fully leveraging the role of expansion function.

[0082] In some illustrative embodiments, as illustrated in FIG. 6, the air conditioner further includes a fan 6, and the fan 6 is located in the middle frame 1. By way of example, the fan 6 is located between the functional bracket 3 and the air outlet 12, and the fan 6 is configured to promote air flow. Specifically, in the cooling mode, under the action of the fan 6, the external air is sucked into the air inlet 11, and after passing through the functional module 4 and the functional bracket 3, it is cooled by the evaporator 5, and then the cold air with the expansion function is passed through the air outlet 12, and the fan 6 may be used to plan the air flow path and increase the flow rate to a certain extent.

[0083] In some illustrative embodiments, the air conditioner further includes a filter screen assembly (not illustrated in the figure), the filter screen assembly is located at the air inlet 11 and arranged in the middle frame 1, and the filter screen assembly is used to filter impurities such as dust and particles in the external air.

[0084] In some other embodiments, the functional bracket 3 may also be connected to the filter screen assembly, that is, the functional bracket 3 is not directly connected to the middle frame 1, but is indirectly connected to the middle frame 1 through the filter screen assembly, such that the external air introduced from the air inlet 11 may directly pass through the functional module 4 and the functional bracket 3, further shortening the airflow path.

Embodiment 2

[0085] The present embodiment provides an air conditioner frame structure, as illustrated in FIGS. 7 to 8, the air conditioner frame structure includes a middle frame 1, a face cover 2 and a functional bracket 3, the middle frame 1 has an opening 10, and the face cover 2 selectively covers the opening 10. The functional bracket 3 is arranged on the middle frame 1 and facing the opening 10, and the functional bracket 3 is config-

ured to mount the functional module 4.

[0086] For example, the face cover 2 may be rotatably connected to the middle frame 1, and the user may realize opening and closing of the opening 10 by flipping the face cover 2; or the face cover 2 may be slidably connected to the middle frame 1, for example, one of the face cover 2 and the middle frame 1 has a slide block, the other has a slide rail, the slide block is slidably fitted with the slide rail, and the user may realize opening and closing of the opening 10 by moving the face cover 2. Of course, the connection between the face cover 2 and the middle frame 1 includes, but is not limited to, a rotational connection and a sliding connection, and other connection modes may also be used, and as long as the opening 10 may be opened and closed.

[0087] Specifically, as a wearing part, the functional module 4 needs to be replaced frequently, and when the functional module 4 needs to be replaced, the user moves the face cover 2 in a direction away from the opening 10 to open the opening 10 and realize the opening of the opening 10, which is convenient for the user to disassemble and replace the functional module 4 mounted on the functional bracket 3; when the functional module 4 is mounted or the replacement functional module 4 does not need to be mounted, the user moves the face cover 2 in a direction toward the opening 10 to close the opening 10, and the face cover 2 blocks the opening 10, which has good aesthetic appearance.

[0088] The existing functional bracket 3 is arranged on the filter screen assembly, and when the functional module 4 needs to be replaced, the face cover 2 needs to be opened, and the health module needs to be replaced after the filter screen assembly is taken out, such that the user needs to complete three steps of operation. In the air conditioner frame structure provided by the present embodiment, the functional bracket 3 is arranged in the middle frame 1, and when the functional module 4 needs to be replaced, the functional module 4 may be replaced from the functional bracket 3 only by opening the face cover 2, without disassembling the filter screen assembly, reducing operation steps and improving operation convenience. At the same time, the functional bracket 3 is arranged facing the opening 10, which is convenient for the user or after-sale service to take out the functional module 4 located on the functional bracket 3 from the opening 10, and improves the efficiency of replacing the functional module 4.

[0089] It could be understood that the structure of the air conditioner frame structure disclosed in the present embodiment is similar to that of Embodiment 1, and the difference is only in the structure of the face cover 2 and the opening 10, in which the structure and function of the functional bracket 3 are similar to the functional bracket 3 disclosed in Embodiment 1, such that detailed description will not be made.

Embodiment 3

[0090] As illustrated in FIGS. 3 to 4, the present embodiment provides a functional bracket 3, the functional bracket 3 includes a bearing portion 31 and a connection portion 32, the bearing portion 31 is configured to bear the functional module 4, and the connection portion 32 has a first end connected to the bearing portion 31, and a second end configured to be connected to the middle frame 1.

[0091] In the functional bracket 3 provided in the present embodiment, the bearing portion 31 provides a mounting position for the functional module 4, and the bearing portion 31 is configured to bear the functional module 4, that is, the bottom surface 42 of the functional module 4 in the third direction is in contact with the bearing portion 31, and the bearing portion 31 provides a certain supporting force for the functional module 4, the functional module 4 is not stressed after being mounted, thus having good mounting reliability. Even if the functional module 4 is loosely mounted, the functional module 4 will be limited to the bearing portion 31 and will not fall on other components in the air conditioner, reducing quality risks such as heat exchange and water leakage. In addition, the bearing portion 31 is connected to the middle frame 1 through the connection portion 32, and the connection portion 32 plays the role of intermediate connection, such that the bearing portion 31 and the middle frame 1 form an integral structure, and the bearing portion 31 and the connection portion 32 also play the role of strengthening the middle frame 1 to a certain extent, to improve the structural strength of the middle frame 1.

[0092] There may be a plurality of connection modes between the functional bracket 3 and the middle frame 1, and for example, at least part of the middle frame 1, the connection portion 32, and the bearing portion 31 are integrally formed, for example, the middle frame 1, the connection portion 32, and the bearing portion 31 are integrally formed, which reduces the links of parts assembly and saves production costs. By way of example, at least one of the middle frame 1 and the bearing portion 31 is detachably connected to the connection portion 32, for example, the connection portion 32 has a first end detachably connected to the middle frame 1, and a second end detachably connected to the bearing portion 31, and the middle frame 1, the connection portion 32, and the bearing portion 31 have a split structure, which is convenient to mount and disassemble, and is convenient for subsequent maintenance and replacement.

[0093] It could be understood that in some other embodiments, the connection portion 32 includes, but is not limited to, the middle frame 1, and the connection portion 32 may also be connected to other carrier devices.

[0094] As illustrated in FIGS. 3 to 4, the outer shape of the bearing portion 31 is similar to a rectangular

structure, and a width direction of the bearing portion 31 is defined as a first direction, the first direction is identified by D1, a length direction of the bearing portion 31 is a second direction, the second direction is identified by D2, a height direction of the bearing portion 31 is a third direction, and the third direction is identified by D3, in which the first direction, the second direction, and the third direction are perpendicular to each other in pairs, and the first direction, the second direction, and the third direction only represent the spatial direction and have no substantial significance.

[0095] The bearing portion 31 has a mounting groove 310, the mounting groove 310 is configured to mount the functional module 4, and the mounting groove 310 provides a mounting position and an accommodation space for the functional module 4. Specifically, the side of the bearing portion 31 facing the opening 10 is recessed in a direction away from the opening 10 to form the mounting groove 310, and the groove depth of the mounting groove 310 is larger than the thickness of the functional module 4 in the third direction, and the functional module 4 may be at least partially embedded in the mounting groove 310, reducing the protrusion of the functional module 4 from the bearing portion 31. By way of example, in the third direction, the groove depth of the mounting groove 310 is equal to the thickness of the functional module 4, and when the functional module 4 is placed in the mounting groove 310, the functional module 4 and the bearing portion 31 are arranged approximately flush, resulting in relatively good aesthetic appearance.

[0096] Specifically, the mounting groove 310 may optionally be a rectangular groove, the outer shape of the functional module 4 is similar to a rectangular parallelepiped structure, and the inner wall of the mounting groove 310 is adapted to the outer wall contour of the functional module 4.

[0097] Specifically, the mounting groove 310 includes a groove bottom 3101 and a groove wall 3102, the groove wall 3102 is arranged on the groove bottom 3101 and arranged around the groove bottom 3101, the groove bottom 3101 provides a certain supporting force for the functional module 4, and the groove wall 3102 is configured for circumferential limit of the functional module 4, which reduces the position deviation of the functional module 4 along the first direction and/or the second direction, and improves the mounting stability of the functional module 4.

[0098] If the external air introduced from the air inlet 11 passes through the functional module 4, overflows from a same side or around the functional module 4 and is discharged to the air outlet 12, the airflow path has a zigzag line structure, and the airflow path is relatively long. For this purpose, the bearing portion 31 has a ventilation hole 313, and by way of example, the ventilation hole 313 may have an optional through hole structure, for example, the ventilation hole 313 is a rectangular through hole.

[0099] In this way, when the external air introduced from the air inlet 11 passes through the functional module 4, the external air enters from one side of the functional module 4 along the third direction and is discharged from the other side, and then is directly discharged through the ventilation hole 313, that is, an air inlet side and an air outlet side of the functional module 4 are located on two sides of the functional module 4 along the third direction, and the air entering the functional module 4 and the air discharged from the functional module 4 do not have airflow interference to ensure ventilation smoothness. At the same time, the airflow path is approximately linear, which reduces the degree of bending and improves the efficiency of airflow circulation.

[0100] By way of example, one ventilation hole 313 may be provided, and an area of the ventilation hole 313 is slightly smaller than an area of the bottom surface 42 of the functional module 4 in the third direction, increasing an exposed area of the bottom surface 42 of the functional module 4 in the third direction and improving ventilation smoothness; a plurality of ventilation holes 313 are arranged may be provided, and the plurality of ventilation holes 313 are arranged in the second direction, for example, three ventilation holes 313 are provided, and the three ventilation holes 313 are arranged in the second direction at intervals, while increasing the ventilation area, the portion of the bearing portion 31 between two adjacent ventilation holes 313 may also provide a certain supporting force for the functional module 4 to ensure the mounting stability of the functional module 4.

[0101] In some illustrative embodiments, as illustrated in FIGS. 3 to 4, the functional bracket 3 further includes a limiting portion 33, and the limiting portion 33 is arranged on a side of the bearing portion 31 away from the connection portion 32 to avoid positional interference between the limiting portion 33 and the connection portion 32. The limiting portion 33 extends toward the mounting groove 310, and the limiting portion 33 is configured to limit the functional module 4 such that the functional module 4 is located between the limiting portion 33 and the bearing portion 31.

[0102] In this way, the bottom surface 42 of the functional module 4 along the third direction is in contact with the bearing portion 31, and the top surface 41 of the functional module 4 along the third direction may be blocked by the limiting portion 33. Under the joint action of the bearing portion 31 and the limiting portion 33, the front and rear limiting function of the functional module 4 along the third direction is realized, and the situation that the functional module 4 has a large positional deviation along the third direction is avoided.

[0103] By way of example, the limiting portion 33 may be welded, bolted to the bearing portion 31, or the limiting portion 33 and the bearing portion 31 may be integrally formed. Optionally, the limiting portion 33 may have a structure such as a limiting block, a limiting

piece, a limiting arm, and a snap. For example, the limiting portion 33 is a limiting piece extending in the first direction, and the limiting piece and a side wall of the bearing portion 31 are arranged at an included angle. For example, the limiting piece and the side wall of the bearing portion 31 are perpendicular to each other, and are configured to fit with two adjacent right-angled sides of the functional module 4.

[0104] By way of example, a plurality of limiting portions 33 may be optionally provided, and the plurality of limiting portions 33 are located on at least one side of the bearing portion 31, for example, five limiting portions 33 are provided, three limiting portions 33 of the five limiting portions 33 are provided on one side of the bearing portion 31 in the first direction, and the other two limiting portions 33 are provided on the other side of the bearing portion 31 in the first direction. Of course, in some other embodiments, the plurality of limiting portions 33 may be symmetrically arranged on two sides of the bearing portion 31 along the first direction; and/or the plurality of limiting portions 33 may be symmetrically arranged on two sides of the bearing portion 31 in the second direction.

[0105] In another embodiment, the limiting portion 33 is capable of snapping onto the functional module 4, such that the bottom surface 42 of the functional module 4 in the third direction may abut against the bearing portion 31, and the top surface 41 of the functional module 4 in the third direction may abut against the limiting portion 33, and the limiting portion 33 may realize the fixation of the functional module 4 while realizing the limiting of the functional module 4, improving the mounting stability of the functional module 4.

[0106] By way of example, there may be a plurality of snapping modes between the limiting portion 33 and the functional module 4, for example, one of the limiting portion 33 and the functional module 4 has a snap, the other has a slot corresponding to the snap, and the snap is snapped into the slot; or the limiting portion 33 is a limiting piece extending in the first direction, an included angle between the limiting piece and the side wall of the bearing portion 31 is an acute angle, and the limiting piece may abut against the top surface 41 of the functional module 4 in the third direction.

[0107] By way of example, one end of the limiting portion 33 along the first direction and away from the bearing portion 31 has a chamfer or a guide inclined surface, and when the functional module 4 is mounted, the chamfer or the guide inclined surface may provide a certain guide force for the functional module 4, such that the functional module 4 may slide into the bearing portion 31 along the chamfer or the guide inclined surface, improving the mounting convenience.

[0108] The bearing portion 31 of the functional bracket 3 is connected to the middle frame 1 through the connection portion 32, and the connection portion 32 plays the role of an intermediate connection, such that the bearing portion 31 and the middle frame 1 form an

integral structure.

[0109] By way of example, in some other embodiments, the connection portion 32 may also have an integral structure, and the connection portion 32 has an annular structure, such that each position in the circumferential direction of the bearing portion 31 may be connected to the middle frame 1 through the connection portion 32, and the connecting area is relatively large, improving the connection effect.

[0110] By way of example, the connection portion 32 may have a split structure, a plurality of connection portions 32 are provided, and the plurality of connection portions 32 are arranged on at least one side of the bearing portion 31, such that there are relatively numerous connection points between the functional bracket 3 and the bracket of the middle frame 1, the connection points between the functional bracket 3 and the bracket of the middle frame 1 is increased, and the connection stability between the functional bracket 3 and the middle frame 1 is improved. The plurality of connection portions 32 may be arranged on two sides of the bearing portion 31 opposite to each other in the first direction and/or the second direction, or may be arranged on one or three sides of the bearing portion 31. The structural shapes of the plurality of connection portions 32 may be the same, different, or partially the same.

[0111] In some illustrative embodiments, the plurality of connection portions 32 are arranged around the bearing portion 31, and a hollow portion 320 is formed between two adjacent connection portions 32.

[0112] By forming the hollow portion 320 between the two adjacent connection portions 32, the air resistance can be reduced, and the external air introduced from the air inlet 11 may be discharged through the hollow portion 320, reducing the risk that the connection portion 32 hinders the flow of airflow. Since the plurality of connection portions 32 are arranged around the bearing portion 31, the plurality of hollow portions 320 are also arranged around the bearing portion 31 to guide the air introduced from the air inlet 11 toward the bearing portion 31, and to a certain extent, play the role of airflow collection.

[0113] In some illustrative embodiments, the bearing portion 31 has a first side edge 311 and a second side edge 312 connected to each other, a first gap 34 is formed between the first side edge 311 and the middle frame 1 correspondingly connected to the first side edge 312, a second gap 35 is formed between the second side edge 312 and the middle frame 1 correspondingly connected to the second side edge 312, and the width of the first gap 34 in the first direction is larger than the width of the second gap 35 in the first direction; the length of the connection portion 32 located in the first gap 34 in the second direction is smaller than the length of the connection portion 32 located in the second gap 35 in the second direction.

[0114] By way of example, the first side edge 311 and the second side edge 312 may be two opposite side

edges of the bearing portion 31 in the first direction; the first side edge 311 and the second side edge 312 may also be two opposite side edges of the bearing portion 31 in the second direction; and the first side edge 311 and the second side edge 312 may also be two adjacent side edges of the bearing portion 31. In the present embodiment, for example, the first side edge 311 and the second side edge 312 are two opposite side edges of the bearing portion 31 in the first direction, and the first side edge 311 may be referred to as an upper side edge of the bearing portion 31, and the second side edge 312 may be referred to as a lower side edge of the bearing portion 31.

[0115] By way of example, the first gap 34 is substantially the distance between the first side edge 311 and the corresponding middle frame 1 in the first direction, and the second gap 35 is substantially the distance between the second side edge 312 and the corresponding middle frame 1 in the first direction.

[0116] If the width of the first gap 34 in the first direction is larger than the width of the second gap 35 in the first direction, which means that the distance between the first side edge 311 and the middle frame 1 is relatively large, the length of the connection portion 32 located in the first gap 34 in the second direction is relatively small, and the connection portion 32 is similar to a cylindrical or rod-shaped structure, that is, the connection between the first side edge 311 and the middle frame 1 is approximately point contact, and the connection area can be increased by increasing the number of connection portions 32; If the distance between the second side edge 312 and the middle frame 1 is relatively small, the length of the connection portion 32 located in the second gap 35 in the second direction is relatively large, and the connection portion 32 is similar to a strip-shaped structure, that is, the connection between the second side edge 312 and the middle frame 1 is approximately surface contact, which increases the connection area, and may solve the problem that the first gap 34 is too small and it is inconvenient to provide the plurality of connection portions 32.

Embodiment 4

[0117] The present embodiment provides a functional assembly, as illustrated in FIG. 9, the functional assembly includes a functional module 4 and a functional bracket 3, and the functional module 4 is detachably connected to the functional bracket 3.

[0118] In the functional assembly provided by the present embodiment, the functional bracket 3 provides a mounting position for the functional module 4, the functional module 4 is not completely fixed on the functional bracket 3, the functional module 4 is detachably connected to the functional bracket 3, and the user or after-sale service may mount and disassemble the functional module 4 according to the actual use needs, which is free and flexible.

[0119] By way of example, the functional module 4 includes at least one of a mosquito repellent portion, a fragrance portion, a formaldehyde removal portion, an organic matter removal portion, a filter screen portion, and a humidification portion.

[0120] Specifically, the mosquito repellent portion is configured to repel mosquitoes, which may be achieved by releasing specific chemicals, such as mosquito repellents in mosquito repellent liquids; or use physical methods to achieve the purpose of repelling mosquitoes, such as ultrasonic mosquito repellent. The fragrance portion may improve the air smell and create a comfortable environment by releasing fragrance or aromatherapy. The formaldehyde removal portion is configured to remove formaldehyde in the air, for example, by activated carbon adsorption or chemical catalytic decomposition of formaldehyde. The organic matter removal portion is configured to remove organic pollutants from the air, and the organic pollutants usually come from paints, cleaners, tobacco smoke, etc., for example, volatile organic compounds (VOCs). The filter screen portion is configured to filter dust, etc. in the air. The filter screen portion may be specifically selected as an IFD filter screen portion, which removes dust, pollen, bacteria, etc. by ionizing particles in the air and adsorbing them on the filter screen. The humidification portion may increase the humidity of the air by increasing the moisture in the air, and improve the dry environment.

[0121] Specifically, as illustrated in FIG. 10, the functional module 4 is similar to a rectangular parallelepiped structure, the functional module 4 has a top surface 41, a bottom surface 42, and a peripheral surface 40, and the top surface 41 and the bottom surface 42 are located on two sides of the functional module 4 in the third direction. The functional module 4 further has a peripheral surface 40 around the third direction, and the peripheral surface 40 is located between and connected to the top surface 41 and the bottom surface 42.

[0122] In some illustrative embodiments, as illustrated in FIGS. 11 to 12, the functional bracket 3 includes a bearing portion 31, the functional module 4 is arranged on the bearing portion 31, the outer shape of the bearing portion 31 is similar to a rectangular structure, and the width direction of the bearing portion 31 is defined as a first direction, the first direction is identified by D1, the length direction of the bearing portion 31 is a second direction, the second direction is identified by D2, the height direction of the bearing portion 31 is a third direction, and the third direction is identified by D3, in which the first direction, the second direction, and the third direction are perpendicular to each other in pairs, and the first direction, the second direction, and the third direction only represent the spatial direction and have no substantial significance.

[0123] If the functional module is buckled on the filter assembly or hung on the functional bracket, the functional module will fall off due to long-term stress. When

the functional module falls on other components such as the evaporator, it will affect the heat exchange of the air conditioner or cause quality problems such as water leakage.

[0124] For this reason, as illustrated in FIGS. 10 to 12, the bearing portion 31 is configured to bear the functional module 4, the bottom surface 42 of the functional module 4 in the third direction is in contact with the bearing portion 31, the bearing portion 31 provides a certain supporting force for the functional module 4, the functional module 4 is not stressed after being mounted, thus having good mounting reliability. Even if the functional module 4 is loosely mounted, the functional module 4 will be limited to the bearing portion 31 and will not fall on other components in the air conditioner, reducing quality risks such as heat exchange and water leakage.

[0125] Specifically, the bearing portion 31 has a mounting groove 310, the mounting groove 310 is configured to mount the functional module 4, and the mounting groove 310 provides a mounting position and an accommodation space for the functional module 4. Specifically, in the third direction, the groove depth of the mounting groove 310 is larger than the thickness of the functional module 4, and the functional module 4 may be at least partially embedded in the mounting groove 310, reducing the protrusion of the functional module 4 from the bearing portion 31. Alternatively, in the third direction, the groove depth of the mounting groove 310 is equal to the thickness of the functional module 4, and when the functional module 4 is placed in the mounting groove 310, the functional module 4 and the bearing portion 31 are arranged approximately flush, resulting in relatively good aesthetic appearance.

[0126] Specifically, the mounting groove 310 may optionally be a rectangular groove, the outer shape of the functional module 4 is similar to a rectangular parallelepiped structure, and the inner wall of the mounting groove 310 is adapted to the outer wall contour of the functional module 4.

[0127] Specifically, the mounting groove 310 includes a groove bottom 3101 and a groove wall 3102, the groove wall 3102 is arranged on the groove bottom 3101 and arranged around the groove bottom 3101, and the groove bottom 3101 provides a certain supporting force for the functional module 4. The groove wall 3102 of the mounting groove 310 may abut against the peripheral surface 40, and is configured for circumferential limit of the functional module 4, to reduce the positional deviation of the functional module 4 in the first direction and/or the second direction, and improve the mounting stability of the functional module 4.

[0128] If the external air introduced from the air inlet 11 passes through the functional module 4, overflows from the same side or around the functional module 4 and is discharged to the air outlet 12, the airflow path is similar to a zigzag line structure, and the airflow path is relatively long. For this purpose, the bearing portion 31

has a ventilation hole 313, and by way of example, the ventilation hole 313 may have an optional through hole structure, for example, the ventilation hole 313 is a rectangular through hole.

[0129] In this way, when the external air introduced from the air inlet 11 passes through the functional module 4, the external air enters from one side of the functional module 4 along the third direction and is discharged from the other side, and then is directly discharged through the ventilation hole 313, that is, an air inlet side and an air outlet side of the functional module 4 are located on two sides of the functional module 4 along the third direction, and the air entering the functional module 4 and the air discharged from the functional module 4 do not have airflow interference to ensure ventilation smoothness. At the same time, the airflow path is approximately linear, which reduces the degree of bending and improves the efficiency of airflow circulation.

[0130] By way of example, one ventilation hole 313 may be provided, and an area of the ventilation hole 313 is slightly smaller than an area of the bottom surface 42 of the functional module 4 in the third direction, increasing an exposed area of the bottom surface 42 of the functional module 4 in the third direction and improving ventilation smoothness; a plurality of ventilation holes 313 are arranged may be provided, and the plurality of ventilation holes 313 are arranged in the second direction, for example, three ventilation holes 313 are provided, and the three ventilation holes 313 are arranged in the second direction at intervals, while increasing the ventilation area, the portion of the bearing portion 31 between two adjacent ventilation holes 313 may also provide a certain supporting force for the functional module 4 to ensure the mounting stability of the functional module 4.

[0131] In some illustrative embodiments, as illustrated in FIGS. 11 to 12, the functional bracket 3 further includes a limiting portion 33, and the limiting portion 33 is arranged on a side of the bearing portion 31 away from the connection portion 32 to avoid positional interference between the limiting portion 33 and the connection portion 32. The limiting portion 33 extends toward the mounting groove 310, the functional module 4 is located between the limiting portion 33 and the bearing portion 31, and the limiting portion 33 is configured to limit the functional module 4.

[0132] In this way, the bottom surface 42 of the functional module 4 along the third direction is in contact with the bearing portion 31, and the top surface 41 of the functional module 4 along the third direction may be blocked by the limiting portion 33. Under the joint action of the bearing portion 31 and the limiting portion 33, the front and rear limiting function of the functional module 4 along the third direction is realized, and the situation that the functional module 4 has a large positional deviation along the third direction is avoided.

[0133] By way of example, the limiting portion 33 may

be welded, bolted to the bearing portion 31, or the limiting portion 33 and the bearing portion 31 may be integrally formed. Optionally, the limiting portion 33 may have a structure such as a limiting block, a limiting piece, a limiting arm, and a snap. For example, the limiting portion 33 is a limiting piece extending in the first direction, and the limiting piece and a side wall of the bearing portion 31 are arranged at an included angle. For example, the limiting piece and the side wall of the bearing portion 31 are perpendicular to each other, and are configured to fit with two adjacent right-angled sides of the functional module 4.

[0134] By way of example, a plurality of limiting portions 33 may be optionally provided, and the plurality of limiting portions 33 are located on at least one side of the bearing portion 31, for example, five limiting portions 33 are provided, three limiting portions 33 of the five limiting portions 33 are provided on one side of the bearing portion 31 in the first direction, and the other two limiting portions 33 are provided on the other side of the bearing portion 31 in the first direction. Of course, in some other embodiments, the plurality of limiting portions 33 may be symmetrically arranged on two sides of the bearing portion 31 in the first direction; and/or the plurality of limiting portions 33 may be symmetrically arranged on two sides of the bearing portion 31 in the second direction.

[0135] In another embodiment, the limiting portion 33 is capable of snapping onto the functional module 4, such that the bottom surface 42 of the functional module 4 in the third direction may abut against the bearing portion 31, and the top surface 41 of the functional module 4 in the third direction may abut against the limiting portion 33, and the limiting portion 33 may realize the fixation of the functional module 4 while realizing the limiting of the functional module 4, improving the mounting stability of the functional module 4.

[0136] By way of example, there may be a plurality of snapping modes between the limiting portion 33 and the functional module 4, for example, one of the limiting portion 33 and the functional module 4 has a snap, the other has a slot corresponding to the snap, and the snap is snapped into the slot; or the limiting portion 33 is a limiting piece extending in the first direction, an included angle between the limiting piece and the side wall of the bearing portion 31 is an acute angle, and the limiting piece may abut against the top surface 41 of the functional module 4 in the third direction.

[0137] By way of example, one end of the limiting portion 33 along the first direction and away from the bearing portion 31 has a chamfer or a guide inclined surface, and when the functional module 4 is mounted, the chamfer or the guide inclined surface may provide a certain guide force for the functional module 4, such that the functional module 4 may slide into the bearing portion 31 along the chamfer or the guide inclined surface, improving the mounting convenience.

[0138] In another embodiment, as illustrated in FIGS.

11 to 12, the bearing portion 31 of the functional bracket 3 is connected to the middle frame 1 through the connection portion 32, and the connection portion 32 plays the role of an intermediate connection, such that the bearing portion 31 and the middle frame 1 form an integral structure.

[0139] By way of example, in some other embodiments, the connection portion 32 may also have an integral structure, and the connection portion 32 has an annular structure, such that each position in the circumferential direction of the bearing portion 31 may be connected to the middle frame 1 through the connection portion 32, and the connecting area is relatively large, improving the connection effect.

[0140] By way of example, the connection portion 32 may have a split structure, a plurality of connection portions 32 are provided, and the plurality of connection portions 32 are arranged on at least one side of the bearing portion 31, such that there are relatively numerous connection points between the functional bracket 3 and the bracket of the middle frame 1, and the connection stability between the functional bracket 3 and the middle frame 1 is improved. The plurality of connection portions 32 may be arranged on two sides of the bearing portion 31 opposite to each other in the first direction and/or the second direction, or may be arranged on one or three sides of the bearing portion 31. The structural shapes of the plurality of connection portions 32 may be the same, different, or partially the same.

[0141] In some illustrative embodiments, the plurality of connection portions 32 are arranged around the bearing portion 31, and a hollow portion 320 is formed between two adjacent connection portions 32.

[0142] By forming the hollow portion 320 between the two adjacent connection portions 32, the air resistance can be reduced, and the external air introduced from the air inlet 11 may be discharged through the hollow portion 320, reducing the risk that the connection portion 32 hinders the flow of airflow. Since the plurality of connection portions 32 are arranged around the bearing portion 31, the plurality of hollow portions 320 are also arranged around the bearing portion 31 to guide the air introduced from the air inlet 11 toward the bearing portion 31, and to a certain extent, play the role of airflow collection.

Claims

1. A functional bracket, comprising:

a bearing portion (31) configured to bear a functional module (4); and
a connection portion (32), wherein the connection portion (32) has a first end connected to the bearing portion (31), and a second end configured to be connected to a middle frame (1).

2. The functional bracket according to claim 1, wherein the bearing portion (31) has a mounting groove (310), and the mounting groove (310) is configured to mount the functional module (4); and
the mounting groove (310) comprises a groove bottom (3101) and a groove wall (3102), the groove wall (3102) is arranged on the groove bottom (3101) and arranged around the groove bottom (3101), and the groove wall (3102) is configured for circumferential limit of the functional module (4).

3. The functional bracket according to claim 1 or 2, wherein the bearing portion (31) has a ventilation hole (313).

4. The functional bracket according to any one of claims 1 to 3, wherein the connection portion (32) and the bearing portion (31) are integrally formed; or
the bearing portion (31) is detachably connected to the connection portion (32).

5. The functional bracket according to any one of claims 1 to 4, wherein a plurality of connection portions (32) are provided, the plurality of connection portions (32) are arranged around the bearing portion (31), and a hollow portion (320) is formed between two adjacent connection portions (32).

6. The functional bracket according to any one of claims 2 to 5, further comprising:
a limiting portion (33) arranged on a side of the bearing portion (31) away from the connection portion (32), wherein the limiting portion (33) extends toward the mounting groove (310), and the limiting portion (33) is configured to limit the functional module (4).

7. An air conditioner frame structure, comprising:

a middle frame (1); and
a functional bracket (3) according to any one of claims 1 to 6, wherein the functional bracket (3) is arranged on the middle frame (1), and the functional bracket (3) is configured to mount a functional module (4).

8. The air conditioner frame structure according to claim 7, wherein the middle frame (1) is provided with an opening (10);

the air conditioner frame structure further comprises a face cover (2) connected to the middle frame (1) and selectively covering the opening (10); and
the functional bracket (3) is arranged facing the opening (10).

9. The air conditioner frame structure according to claim 7 or 8, wherein the middle frame (1) has an air inlet (11) and an air outlet (12), and the functional bracket (3) is arranged on a side of the middle frame (1) facing the air inlet (11). 5
10. The air conditioner frame structure according to any one of claims 7 to 9, wherein at least part of the middle frame (1), the connection portion (32), and the bearing portion (31) are integrally formed; 10
or
at least one of the middle frame (1) and the bearing portion (31) is detachably connected to the connection portion (32); and/or 15
wherein the bearing portion (31) has a first side edge (311) and a second side edge (312) connected to each other, a first gap (34) is formed between the first side edge (311) and the middle frame (1) correspondingly connected to the first side edge (311), a second gap (35) is formed between the second side edge (312) and the middle frame (1) correspondingly connected to the second side edge (312), and a width of the first gap (34) in a first direction is larger than a width of the second gap (35) in the first direction; 20
a length of the connection portion (32) located in the first gap (34) in a second direction is smaller than a length of the connection portion (32) located in the second gap (35) in the second direction; and 25
the first direction and the second direction are perpendicular to each other, the first direction is a width direction of the bearing portion (31), and the second direction is a length direction of the bearing portion (31). 30
11. A functional assembly, comprising a functional module (4) and a functional bracket (3) according to any one of claims 1 to 6, wherein the functional module (4) is detachably connected to the functional bracket (3). 35
12. The functional assembly according to claim 11, wherein the functional bracket (3) comprises: 40
a bearing portion (31), wherein the functional module (4) is arranged on the bearing portion (31), and a bottom surface (42) of the functional module (4) in a third direction is in contact with the bearing portion (31); 45
wherein, optionally, the bearing portion (31) has a mounting groove (310), the functional module (4) is arranged in the mounting groove (310), and the functional module (4) has a peripheral surface (40) around the third direction; and 50

the mounting groove (310) comprises a groove bottom (3101) and a groove wall (3102), the groove wall (3102) is arranged on the groove bottom (3101) and arranged around the groove bottom (3101), and the groove wall (3102) is capable of abutting against the peripheral surface (40);
wherein, optionally, the functional bracket (3) further comprises:

a limiting portion (33) arranged on the bearing portion (31) and extending toward the mounting groove (310), wherein the functional module (4) is located between the limiting portion (33) and the bearing portion (31);
wherein, optionally, the limiting portion (33) is capable of snapping onto the functional module (4).

13. The functional assembly according to claim 11 or 12, wherein the functional module (4) comprises at least one of a mosquito repellent portion, a fragrance portion, a formaldehyde removal portion, an organic matter removal portion, an IFD filter portion, and a humidification portion.
14. An air conditioner, comprising an air conditioner frame structure according to any one of claims 7 to 10.
15. The air conditioner according to claim 14, further comprising a functional module (4), wherein the functional module (4) is detachably connected to the functional bracket (3) of the air conditioner frame structure;

wherein, optionally, the air conditioner further comprises an evaporator (5), the evaporator (5) is located in the middle frame (1), the middle frame (1) has an air inlet (11) and an air outlet (12), and the evaporator (5) is located between the air inlet (11) and the air outlet (12), such that air introduced from the air inlet (11) passes through the functional module (4) and the evaporator (5) and is discharged through the air outlet (12); and
wherein an air inlet portion (50) is arranged on a side of the evaporator (5) facing the functional module (4), the air inlet portion (50) is inclined relative to the middle frame (1), and the functional bracket (3) is arranged parallel to and directly opposite the air inlet portion (50).

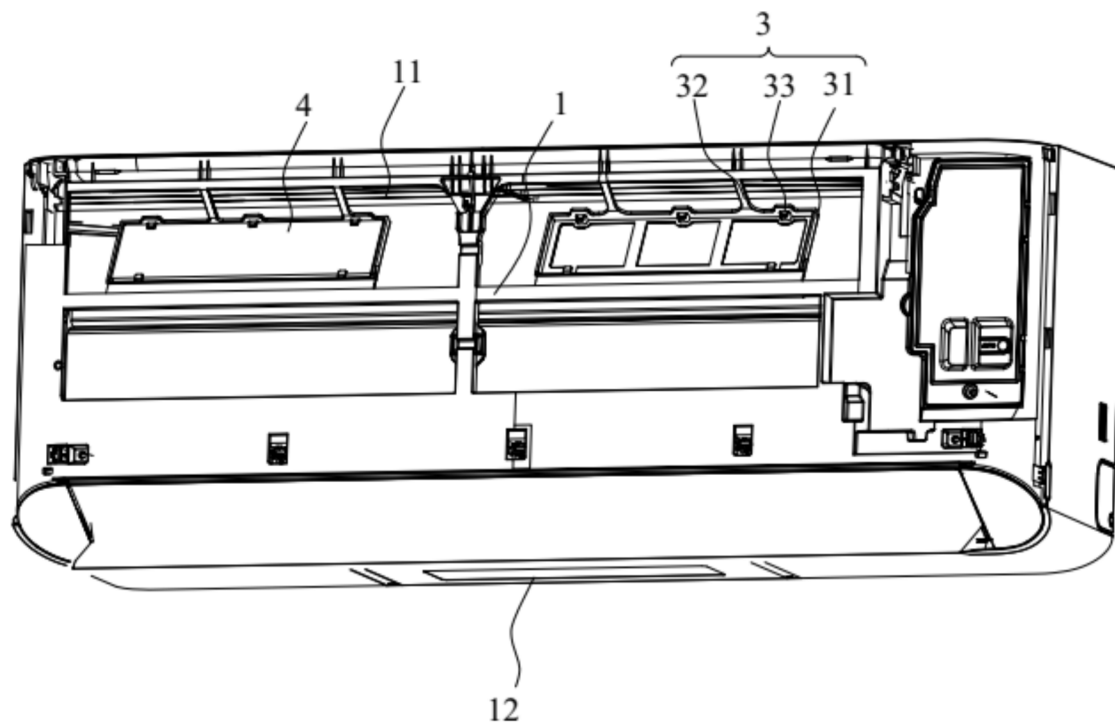


FIG. 1

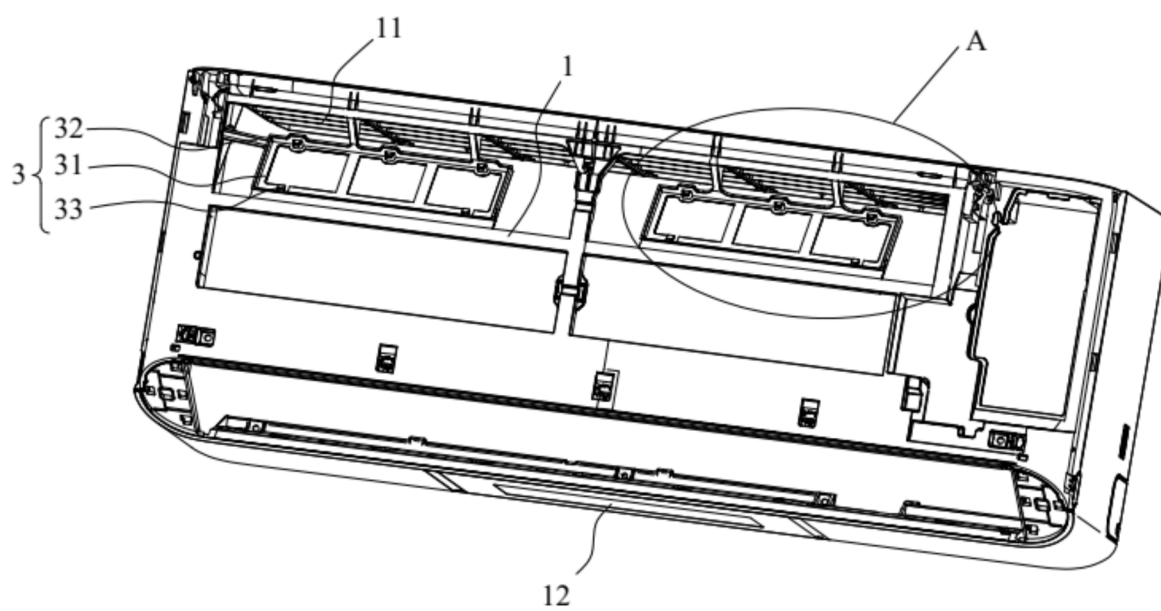


FIG. 2

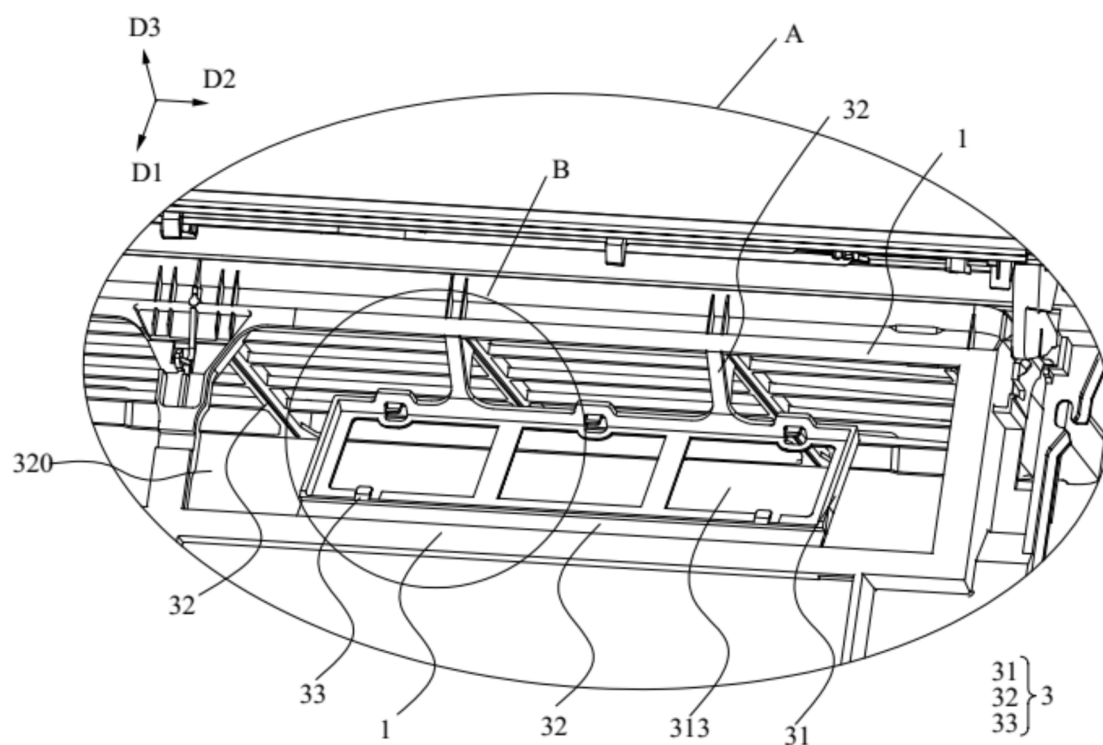


FIG. 3

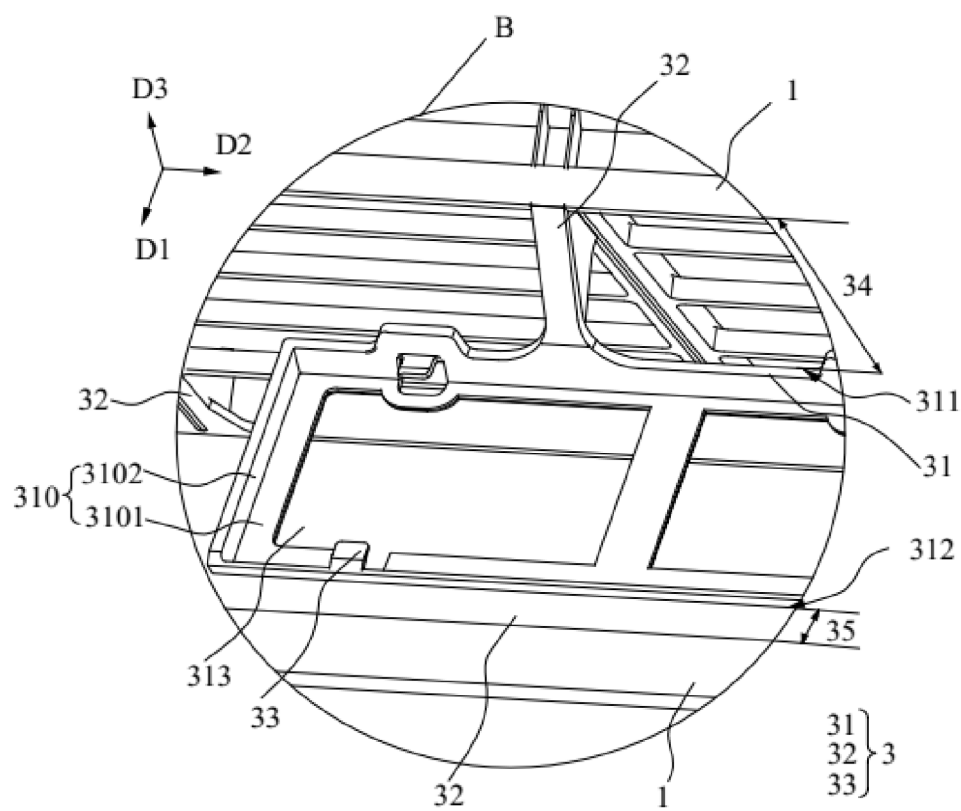


FIG. 4

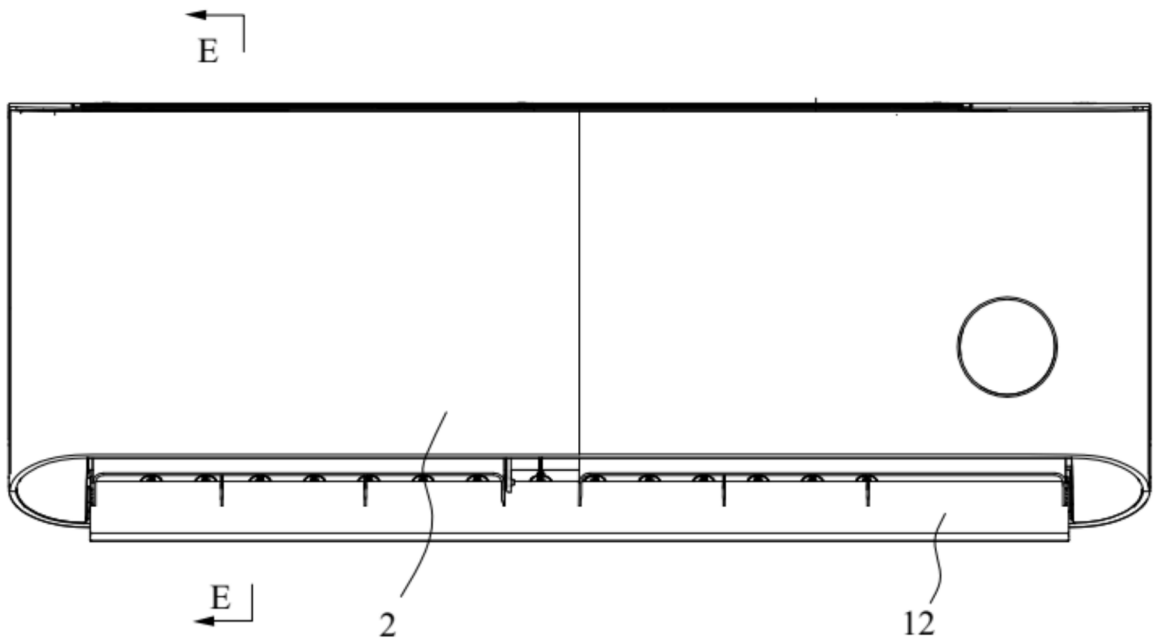


FIG. 5

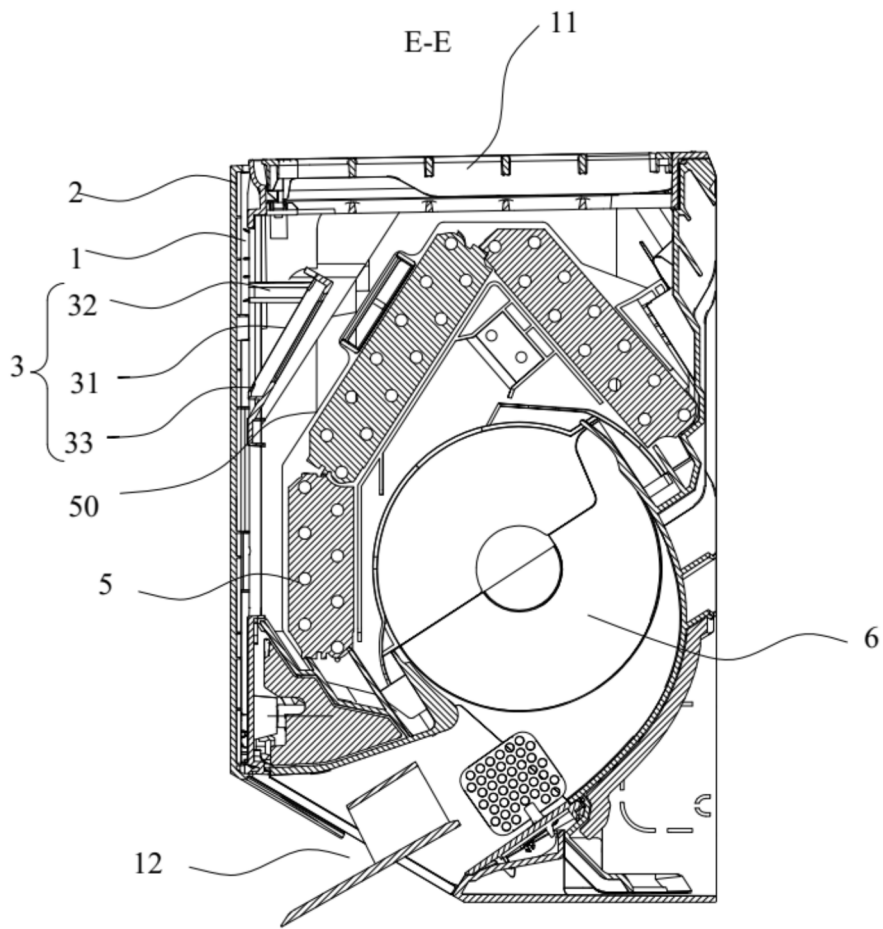


FIG. 6

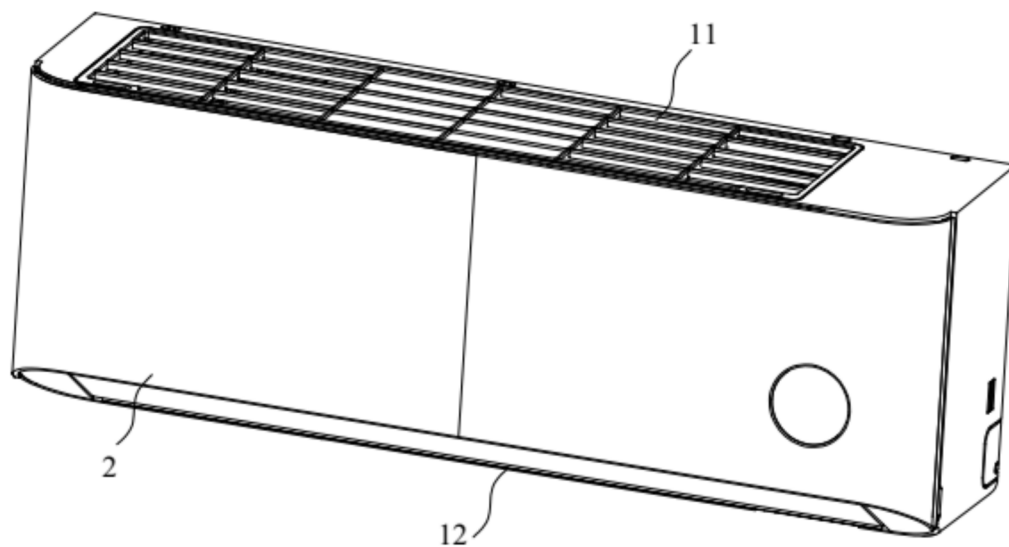


FIG. 7

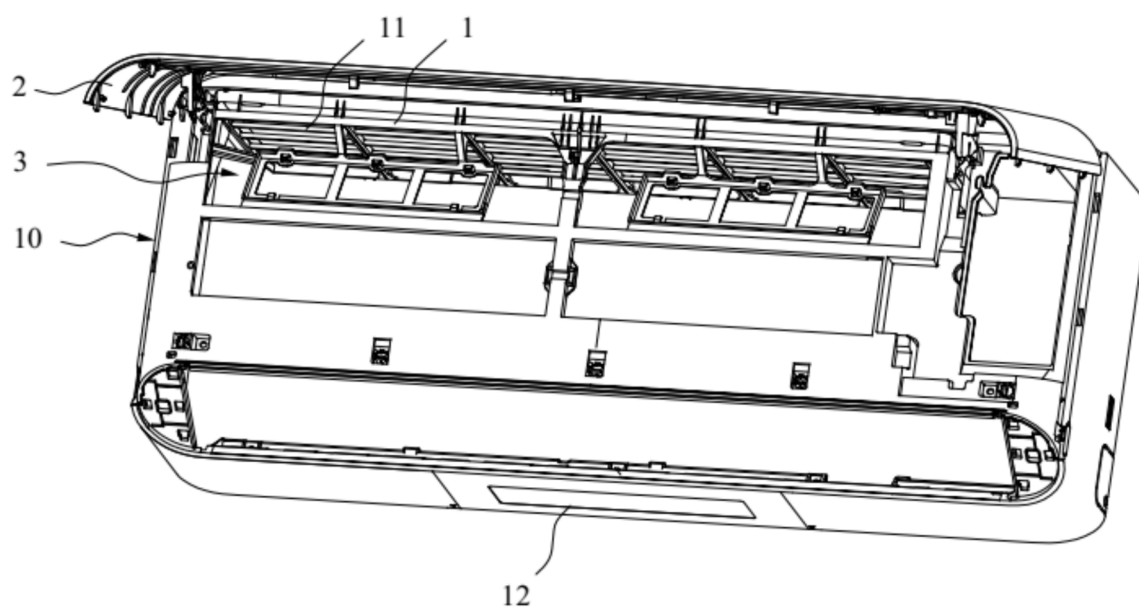


FIG. 8

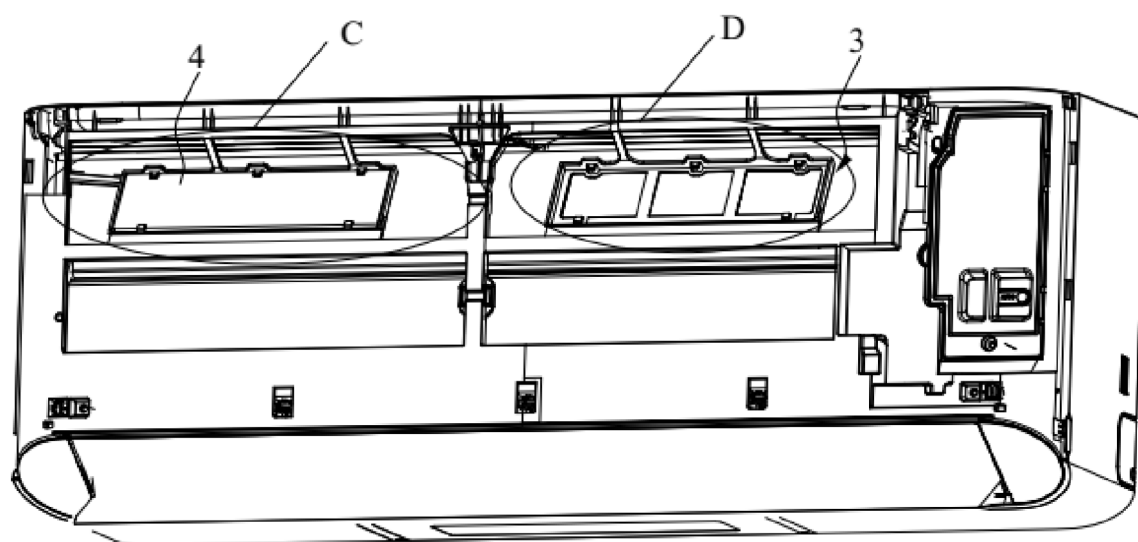


FIG. 9

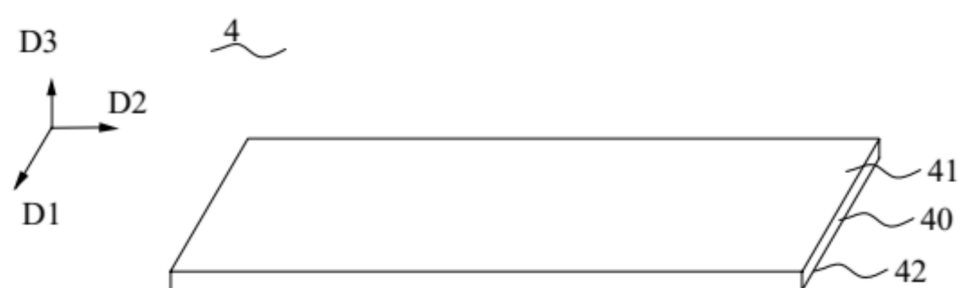


FIG. 10

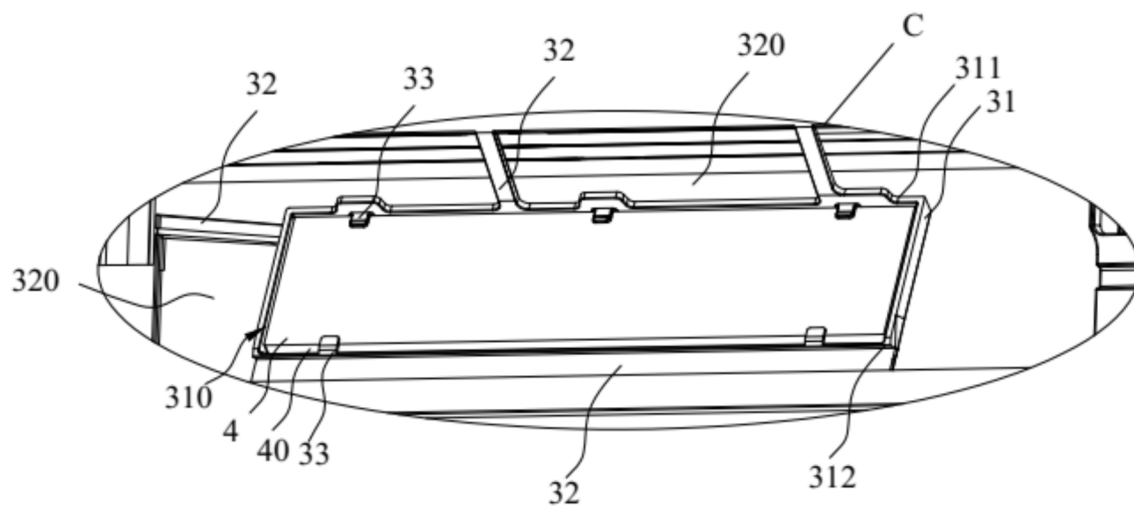


FIG. 11

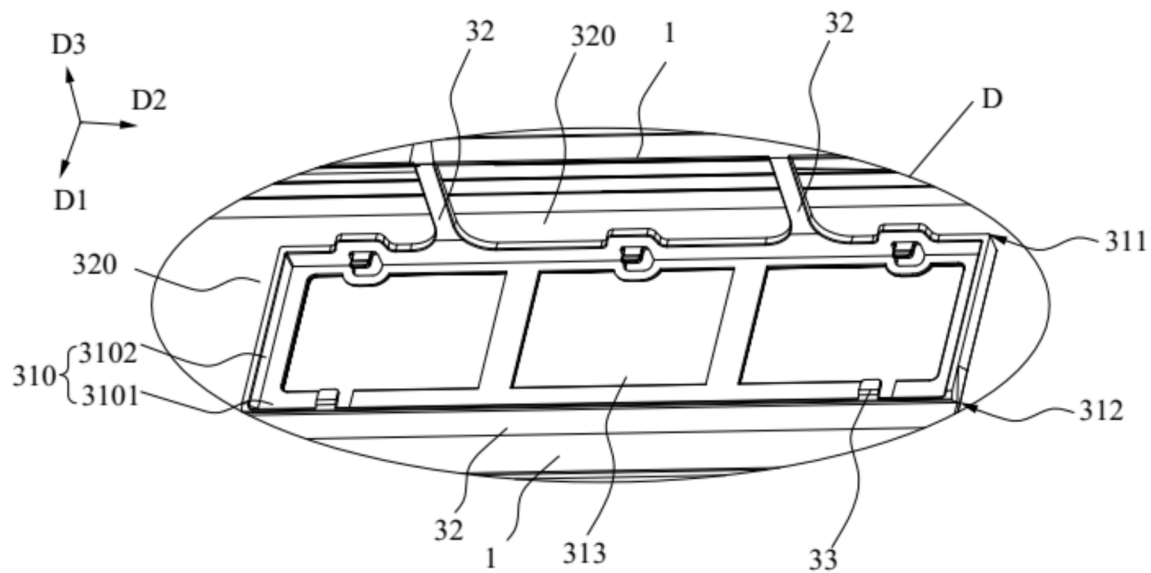


FIG. 12



EUROPEAN SEARCH REPORT

Application Number

EP 25 20 8556

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 210 425 287 U (GREE ELECTRIC APPLIANCES INC ZHUHAI) 28 April 2020 (2020-04-28) * Machine translated description passages.; claims 1-2; figures 1-5 * -----	1-15	INV. F24F1/0007 F24F13/28 F24F13/32
X	CN 117 190 343 A (ANTEL PRODUCTS CO LTD) 8 December 2023 (2023-12-08) * abstract; figure 36 * -----	1-5,7,11	
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X	CN 209 877 165 U (QINGDAO HAIER AIR CONDITIONER; QINGDAO HAIER CO LTD) 31 December 2019 (2019-12-31) * Machine translated description passages corresponding to the figures 1-9.; figures 1-9 * -----	1-5,7,11	TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		25 February 2026	Valenza, Davide
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
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