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(54) **INDOOR UNIT OF AIR CONDITIONER**

(57) An air conditioner indoor unit (100) comprises a panel body (4), a rear casing (8) and a front panel (2) connected with the panel body (4), wherein the chamber of the air conditioner indoor unit (100) is enclosed by the rear casing (8), the panel body (4) and the front panel

(2); the panel body (4) comprises a left side wall (6) and a right side wall (5); and the outer surface of each of the left and the right side walls (6, 5) of the panel body (4) is provided with an outward convex part or an inward concave part.

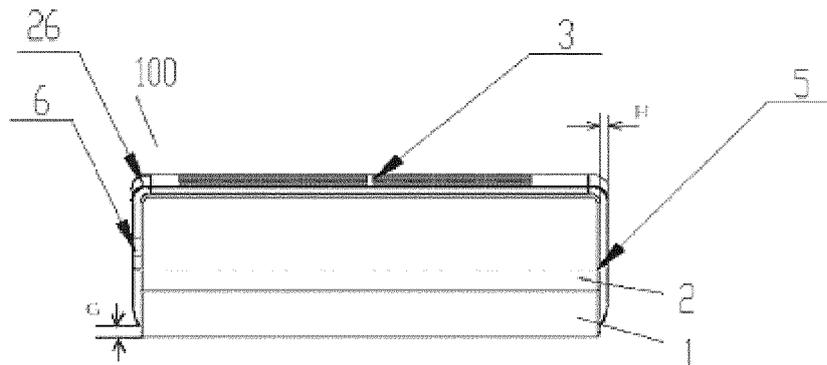


Fig. 1

Description**Technical field of the invention**

[0001] The disclosure relates to an air conditioner indoor unit, in particular to a wall-mounted air conditioner indoor unit.

Background of the invention

[0002] At present, in the prior art, the air conditioner indoor unit generally comprises a panel body, a rear casing and a front panel connected with the panel body. The chamber of the air conditioner is enclosed by the rear casing, the panel body and the front panel. Generally, the left and the right side wall surfaces of the panel body are designed as a plane, so the indoor unit cannot be moved once by two hands due to no point of application of force on the sides of the main body when being conveyed or mounted, particularly when being placed on the floor, thereby being not easy to carry and move. Furthermore, the useless space at the two side corners in the chamber of the indoor unit occupies a relatively large area, so that the whole volume of the air conditioner indoor unit is larger and the inner space is not utilized effectively.

[0003] Furthermore, the left and the right side walls and the top wall of the panel body of the air conditioner indoor unit are generally fixed and non-demountable. Due to the non-demountable left and right side walls of the panel body, the indoor unit cannot be cleaned effectively. Similarly, the top wall where the vent of the indoor unit is located is non-demountable, so that the vent cannot be demounted to be cleaned after the air conditioner is used for a long term. Accordingly, a lot of dust may be accumulated in the grilles of the vent to cause a sanitary hazard. Furthermore, the side walls and the top wall of the air conditioner are non-replaceable, so a common user cannot change the shape of the indoor unit nor update the casing once the indoor unit is mounted.

Summary of the invention

[0004] In order to overcome the defects of the prior art, one objective of the disclosure is to provide an air conditioner indoor unit, which can be improved in the hand-holding effect and is convenient to carry and move.

[0005] Another objective of the disclosure is to provide an air conditioner indoor unit with demountable side walls so that a common user can demount the side walls of the air conditioner indoor unit without any tool.

[0006] The disclosure provides an air conditioner indoor unit, which comprises a panel body, a rear casing and a front panel connected with the panel body, wherein the chamber of the air conditioner indoor unit is enclosed by the rear casing, the panel body and the front panel; the panel body comprises a left side wall and a right side wall; and the outer surface of each of the left and the right

side walls of the panel body is provided with an outward convex part or an inward concave part.

[0007] The disclosure further provides an air conditioner indoor unit, which comprises a panel body, a rear casing and a front panel connected with the panel body, wherein the chamber of the air conditioner indoor unit is enclosed by the rear casing, the panel body and the front panel; the panel body comprises a left side wall and a right side wall; the outer surface of left side wall of the panel body is provided with a left convex part which is convex outwards relative to the plane where the outer edge of the left side wall is located; and the outer surface of right side wall of the panel body is provided with a right convex part which is convex outward relative to the plane where the outer edge of the right side wall is located.

[0008] To sum up, by providing the left and the right side walls of the panel body with the convex part or the concave part, the air conditioner indoor unit is improved in the hand-holding effect and is convenient to carry and move.

[0009] Furthermore, compared with the air conditioner indoor unit in the prior art, the useless space at the corners in the chamber of the air conditioner is removed through the convex part and the concave part without changing the length and height, so as to utilize the inner space of the indoor unit more effectively.

[0010] Preferably, the panel body further comprises at least one side wall connecting plate; and at least one of the left and the right side walls is connected with the at least one side wall connecting plate of the panel body in a demountable way. Through the demountable left and right side walls, which can be demounted without demounting other parts, the air conditioner indoor unit is easy to demount for cleaning. And a common user can replace the left and the right side walls according to their needs and likes to change the appearance of the air conditioner.

[0011] Preferably, the panel body further comprises a top wall connecting plate, with which the top wall is connected in a demountable way. Through the demountable top wall, which can be demounted without demounting other parts, the air conditioner indoor unit is easy to demount for cleaning. And a common user can replace the top wall according to their needs and likes to change the appearance of the air conditioner.

[0012] Furthermore, by providing the convex part with a reinforced rib or increasing the wall thickness of the convex part, the air conditioner indoor unit is enhanced in strength and can be prevented from being damaged when falling off.

Brief description of the drawings

[0013] When read in conjunction with the drawings, the nature, principle and practicability of the disclosure will become clearer through the following detail description, wherein the same component in the drawings is identified by the same reference sign.

Fig. 1 is a schematic front view of an air conditioner indoor unit in a mounting state according to the first embodiment of the disclosure;

Fig. 2 is a space diagram of the air conditioner indoor unit shown in Fig. 1;

Fig. 3 is an exploded perspective view of the air conditioner indoor unit according to the second embodiment of the disclosure;

Fig. 4 is a schematic diagram showing the connection between each side wall and the top wall of the air conditioner indoor unit according to the second embodiment of the disclosure;

Fig. 5 is a schematic diagram showing the inner surface of right side wall of the air conditioner indoor unit according to the second embodiment of the disclosure;

Fig. 6 is a schematic diagram showing the panel body of the air conditioner indoor unit according to the second embodiment of the disclosure, which shows the right side wall connecting plate of the panel body;

Fig. 7 is an enlarged view of a hook in Fig. 5;

Fig. 8 is an enlarged view of an elastic engaging member in Fig. 6;

Fig. 9 is a schematic diagram showing the top wall of the air conditioner indoor unit according to the second embodiment of the disclosure, which shows the inner surface of the top wall;

Fig. 10 is a schematic diagram showing the panel body of the air conditioner indoor unit according to the second embodiment of the disclosure, which shows the left and the right side wall connecting plates and the top wall connecting plate of the panel body;

Fig. 11 is a schematic diagram showing a right convex part;

Fig. 12 is a schematic diagram showing a two-piece right side wall;

Fig. 13 is an exploded perspective view of a first convex part and a second convex part; and

Fig. 14 is a front view of a rear casing.

[0014] The disclosure is further described below through the embodiments and in conjunction with the drawings.

Detailed description of the invention

[0015] See Fig. 1, which is a front view of an air conditioner indoor unit according to the first embodiment of the disclosure. The air conditioner indoor unit is a wall-mounted indoor unit, and Fig. 1 shows the wall-mounted mounting state of the air conditioner indoor unit. Fig. 2 is an exploded perspective view of the air conditioner indoor unit in the embodiment in Fig. 1.

[0016] Terms "front", "rear", "left", "right", "upper" and "lower" described here are applicable to the air conditioner indoor unit in the mounting state in Fig. 1, wherein the direction perpendicular to paper is the front-rear di-

rection, the horizontal direction is the left-right direction and the vertical direction is the upper-lower direction.

[0017] As shown in Figs. 1 and 2, the air conditioner indoor unit 100 comprises a panel body 4, a rear casing 8 (see Fig. 14) and a front panel 2 connected with the panel body. The chamber of the air conditioner indoor unit is enclosed by the panel body 4, the rear casing and the front panel 2. The front panel 2 is connected with the panel body 4 through an engaging member or a hinge and the like, and preferably, the front panel 2 can be opened or closed. The panel body 4 can be further selectively provided with a wind board 1. The wind board 1 is supported by the inner structure of the air conditioner, and optionally, it rotates or swings during the operation of the air conditioner.

[0018] The panel body 4 comprises a top wall 3, a right side wall 5 and a left side wall 6. The outer surface of the right side wall 5 can be provided with an outward convex part or an inward concave part. Similarly, the outer surface of the left side wall 6 can also be provided with an outward convex part or an inward concave part. In the first embodiment shown in Figs. 1 and 2, a right side convex part 7 (which is shown in Fig. 11 separately) which is convex towards the outside of the air conditioner indoor unit relative to the outer edge of right side wall of the panel body 4 is formed on the outer surface of the right side wall 5. A left convex part is symmetrically formed on the outer surface of the left side wall 6.

[0019] It should be noted that, in the disclosure, "the outer surface of the side wall is provided with a convex part", "a convex part is formed on the outer surface of the side wall" or a similar description covers the condition that the whole outer surface of the side wall is formed by the convex part, namely, the whole outer surface of the side wall is convex outwards relative to the outer edge of the side wall. Similarly, "the outer surface of the side wall is provided with a concave part" also covers the condition that the whole outer surface of the side wall is formed by the concave part.

[0020] As shown in Fig. 2, the projections of the left and the right convex parts on the plane perpendicular to the left-right direction (the horizontal direction in Fig. 1) of the air conditioner indoor unit are both a semi-oblong. The projection of outer contour of the panel body 4 on the plane perpendicular to the left-right direction is also a semi-oblong. Each of the left and the right side walls of the panel body 4 is provided with a U-shaped outer edge.

[0021] The outer edges of left and right sides of the panel body 4 enclose the outer edges of the left and the right convex parts respectively. Fig. 2 shows the outer edge 27 of right side of the panel body 4, and the outer edge 27 of the right side encloses the outer edge 28 of the right convex part. In the embodiments in Figs. 1 and 2, the distances G between the outer edges of the left and the right sides and those of the left and the right convex parts are more than 0.5cm. Preferably, the distances G between the outer edges of the left and the right

sides and those of the left and the right convex parts are 1 to 5cm. Furthermore, more preferably, the distances G between the outer edges of the left and the right sides and those of the left and the right convex parts are 2 to 4cm. A hole can be formed on the plane at the distance of 2 to 4cm so that a drain pipe etc. passes through the side of the panel body.

[0022] The convex heights H of the left and the right convex parts are more than 1cm. Preferably, the convex heights H of the convex parts are 1.5 to 5cm. More preferably, the convex heights H of the convex parts are 1.8 to 2.5cm.

[0023] As shown in Figs. 2 and 13, each of the left and the right convex parts can comprises a first convex part 24 located in the middle thereof and a second convex part 25 located on the periphery thereof. Optionally, the projection of the first convex part on the plane perpendicular to the left-right direction is a semi-oblong, and the projection of the second convex part on the plane perpendicular to the left-right direction is a U shape. The distance between the outer edges of the first and the second convex parts gradually increases along the direction from the front-rear part to the lower part of the panel body.

[0024] By providing the left and the right side walls with the convex parts, a point of application of force can be provided on the sides of the indoor unit when it is placed on the floor so that an installer can lift up the indoor unit conveniently by both hands. Accordingly, the air conditioner indoor unit is improved in hand-holding effect and is convenient to carry and move.

[0025] By providing the left and the right side walls with the convex parts, internal parts can be placed in the convex space of the left and the right side walls. Compared with the prior art, the convex parts can utilize the space on the two sides of the air conditioner indoor unit more effectively without changing the length and width of the indoor unit, so as to reduce the useless dead zone in the chamber of the indoor unit.

[0026] Furthermore, the first and the second convex parts can have different colors, so the volume of the whole indoor unit can be further reduced visually.

[0027] Furthermore, as shown in Fig. 1, the outer surface of top wall 3 of the panel body 4 can be provided with a top convex part which is convex outwards relative to the plane where the outer edge of the top wall 3 is located.

[0028] Similarly, such description as "the outer surface of the top wall is provided with a convex part" covers the condition that the whole outer surface of the top wall is formed by the convex part, namely, the whole outer surface of the top wall is convex outwards relative to the outer edge of the top wall.

[0029] As shown in Fig. 1, the left and the right convex parts are connected with the extensions of left and the right sides of the top convex part respectively.

[0030] Furthermore, each of the left and the right side walls is provided with a shoulder 26 extending to the top

wall.

[0031] Although not shown, the top convex part is similar to the left and the right convex parts. Those skilled in the art may think that the top convex part can comprise a first top convex part located in the middle thereof and a second top convex part located on the periphery thereof.

[0032] By providing the top wall with the convex part, compared with a planar top wall, the top wall with the convex part can increase the area of the vent 16 and reduce wind resistance.

[0033] Fig. 3 shows an exploded perspective view of the air conditioner indoor unit according to the second embodiment of the disclosure. Similar to the embodiment above, the panel body 4 of the air conditioner indoor unit 200 also comprises a top wall 3, a right side all 5 and a left side wall 6. For the sake of brevity, only the parts different from the first embodiment are described below, and the same reference numbers refer to the same or similar components.

[0034] As shown in Figs. 3 and 10, the panel body 4 further comprises a right side wall connecting plate 40, a left side wall connecting plate 41 and a top wall connecting plate 42. The right and the left side walls 5, 6 and the top wall 3 are respectively connected to the right and the left side wall connecting plates 40, 41 and the top wall connecting plate 42 of the panel body 4 in a demountable way. Optionally, the right side wall connecting plate and/or the left side wall connecting plate can be integrated with the top wall connecting plate into a whole.

[0035] With reference to Figs. 4 to 8, the connections of the left and the right side walls with the left and the right side wall connecting plates of the panel body 4 are described below.

[0036] As shown in Fig. 4, the left and the right side walls are mounted from top to bottom along the upper-lower direction A. The left side wall 6 and the right side wall 5 are symmetric relative to the vertical central plane of the air conditioner indoor unit, so only the right side wall 5 is described below.

[0037] Furthermore, as shown in Fig. 5, a plurality of hooks 9 are further arranged on the inner surface of the right side wall 5 facing the panel body 4. The number and position of the hooks can be determined as required. In the preferred embodiment of Fig. 5, the right side wall 5 is provided with six hooks 9. Fig. 7 shows an enlarged view of a hook 9. The hook 9 is engaged with an adapting hole 12 in the right side wall connecting plate 40 of the panel body 4 in Fig. 6 to hang the right side wall 5 on the right side wall connecting plate 40 of the panel body 4, so the right side wall 5 cannot be disengaged from the right side wall connecting plate 40. In correspondence with the number of hooks in Fig. 5, the right side wall connecting plate of the panel body 4 in Fig. 6 is provided with six adapting holes 12. Optionally, the hooks 9 are non-elastic hooks.

[0038] When the right side wall 5 is mounted, as shown in Fig. 4, the right side wall 5 is pushed downwards rel-

ative to the right side wall connecting plate of the panel body 4, and the heads of hooks on the right side wall 5 slide into the corresponding adapting holes 12 to be reliably hung on the right side wall connecting plate 40 of the panel body 4 along with the continuous downward moving of the right side wall 5, so that the right side wall 5 is fixed on the right side wall connecting plate 40 of the panel body 4 in a demountable way.

[0039] As shown in Figs. 6 and 8, an elastic engaging member 10 can be arranged on the right side wall connecting plate 40 of the panel body 4. Correspondingly, as shown in Fig. 5, an engaging member adapting part 14 is arranged on the inner surface of the right side wall 5 facing the panel body 4. The elastic engaging member 10 is engaged with the engaging member adapting part 14. Those skilled in the art may think of various ways of realizing the engaging member adapting part 14. For example, the engaging member adapting part can be a gap, a hole, a concave part or an opening and the like between the protuberances for implementing fastening fit.

[0040] Preferably, as shown in Fig. 5, the engaging member adapting part 14 is enclosed by two pairs of limit ribs 22 on the inner surface of the right side wall 5. The elastic engaging member 10 is in fastening fit in the engaging member adapting part 14 so as to prevent the right side wall 5 from moving relative to the right side wall connecting plate 40 of the panel body 4 in the front-back direction and the upper-lower direction.

[0041] Although arranging the hooks 9 on the right side wall and forming the adapting holes 12 on the right side wall connecting plate of the panel body have been described above, those skilled in the art may think of exchanging the two components. This is also applicable to the designs of the elastic engaging member 10 and the engaging member adapting part 22. Those skilled in the art may change the number and position of the components as required.

[0042] By providing the left and the right side walls with the convex parts, as shown in Fig. 6, internal parts can be placed in the convex space on the side walls through a yielding hole 15 on the panel body 4. Compared with the prior art, the convex part can utilize the space on the two sides of the air conditioner indoor unit more effectively without changing the length and width of the indoor unit, thereby reducing the useless dead zone.

[0043] With reference to Figs. 4, 9 and 10, mounting the top wall 3 on the top wall connecting plate 42 of the panel body 4 is described below. The reference number 11 in Fig. 9 refers to the top convex part of the top wall.

[0044] As shown in Fig. 4, the top wall 3 is mounted on the top wall connecting plate 42 of the panel body 4 from top to bottom. The top wall 3 is provided with a hook 23 and a hook 17. The hooks 23, 17 match the adapting holes 13, 19 on the top wall connecting plate 42 respectively so that the top wall is connected to the top wall connecting plate 42 in a demountable way. Optionally, the hook 17 is an elastic hook.

[0045] Furthermore, as shown in Fig. 5, a reinforced

rib 18 can be further arranged on each of the left and the right side walls to enhance their strength.

[0046] Furthermore, locating pins and locating holes can be further formed on each of the left side wall 6, the right side wall 5, the top wall 3 and the panel body 4 in order for connection and location.

[0047] Furthermore, as shown in Fig. 12, the right side wall with the convex part may comprise a base board 20 and a convex board 21, both of which can be connected with each other by gluing, welding, an engaging member or other connection ways.

[0048] Although the left and the right side walls are connected in a demountable way by matching the hooks with the adapting holes and the fastening fit in the embodiment above, those skilled in the art may think of other demountable connection ways, such as matching a slide-way with a sliding part. Similarly, the top wall can also adopt the fastening fit way or the way of matching a slide-way with a sliding part same as that of the left and the right side walls.

[0049] The embodiments above are intended to explain the disclosure clearly instead of limiting the disclosure. The scope of protection and concepts of the disclosure shall be recorded in the claims of the disclosure.

Claims

1. An air conditioner indoor unit, comprising a panel body, a rear casing and a front panel which is connected with the panel body, wherein a chamber of the air conditioner indoor unit is enclosed by the rear casing, the panel body and the front panel; the panel body comprises a left side wall and a right side wall; **characterized in that:** an outer surface of each of the left and the right side walls of the panel body is provided with an outward convex part or an inward concave part.
2. An air conditioner indoor unit, comprising a panel body, a rear casing and a front panel which is connected with the panel body, wherein a chamber of the air conditioner indoor unit is enclosed by the rear casing, the panel body and the front panel; the panel body comprises a left side wall and a right side wall; **characterized in that:** an outer surface of the left side wall of the panel body is provided with a left convex part which is convex outwards relative to a plane where an outer edge of the left side wall is located; and an outer surface of the right side wall of the panel body is provided with a right convex part which is convex outward relative to a plane where an outer edge of the right side wall is located.
3. The air conditioner indoor unit according to claim 2, **characterized in that,** projections of the left and the right convex parts on a plane perpendicular to a left-right direction of the air conditioner indoor unit are

both a semi-oblong.

4. The air conditioner indoor unit according to claim 2, **characterized in that**, each of the left and the right side walls of the panel body is provided with a U-shaped outer edge.
5. The air conditioner indoor unit according to claim 2, **characterized in that**, the outer edges of the left and the right sides of the panel body enclose those of the left and the right convex parts respectively; and distances between the outer edges of the left and the right sides of the panel body and those of the left and the right convex parts are more than 0.5cm.
6. The air conditioner indoor unit according to claim 5, **characterized in that**, the distances between the outer edges of the left and the right sides of the panel body and those of the left and the right convex parts are within 1 to 5cm.
7. The air conditioner indoor unit according to claim 6, **characterized in that**, the distances G between the outer edges of the left and the right sides and those of the left and the right convex parts are within 2 to 4cm.
8. The air conditioner indoor unit according to claim 2, **characterized in that**, convex heights of the left and the right convex parts are more than 1cm.
9. The air conditioner indoor unit according to claim 8, **characterized in that**, the convex heights of the left and the right convex parts are within 1.5 to 5cm.
10. The air conditioner indoor unit according to claim 9, **characterized in that**, the convex heights H of the convex parts are within 1.8 to 2.5cm.
11. The air conditioner indoor unit according to claim 2, **characterized in that**, each of the left and the right convex parts comprises a first convex part located in the middle thereof and a second convex part located on the periphery thereof.
12. The air conditioner indoor unit according to claim 11, **characterized in that**, a projection of the first convex part on a plane perpendicular to a left-right direction of the air conditioner indoor unit is a semi-oblong, and a projection of the second convex part on a plane perpendicular to the left-right direction is a U shape.
13. The air conditioner indoor unit according to claim 12, **characterized in that**, distance between the outer edges of the first and the second convex parts gradually increases along a direction from a front and rear part of the panel body to a lower part of the panel

body.

14. The air conditioner indoor unit according to claim 2, **characterized in that**, the panel body is provided with a top wall; and an outer surface of the top wall is provided with a top convex part which is convex outwards relative to a plane where an outer edge of the top wall is located.
15. The air conditioner indoor unit according to claim 14, **characterized in that**, the top convex part comprises a first top convex part located in the middle thereof and a second top convex part located on the periphery thereof.
16. The air conditioner indoor unit according to claim 14, **characterized in that**, the left and the right convex parts are connected with extensions of left and the right sides of the top convex part respectively.
17. The air conditioner indoor unit according to claim 14, **characterized in that**, the panel body further comprises a top wall connecting plate, with which the top wall is connected in a detachable way.
18. The air conditioner indoor unit according to any one of claims 2 to 4, **characterized in that**, the panel body further comprises at least one side wall connecting plate, with which at least one of the left and the right side walls is connected in a detachable way.
19. The air conditioner indoor unit according to any one of claims 2 to 4, **characterized in that**, the panel body is provided with a top wall; and each of the left and the right side walls is provided with a shoulder extending to the top wall.
20. The air conditioner indoor unit according to claim 18, **characterized in that**, at least one of the left and the right side walls is provided with a first engaging member; at least one side wall connecting plate is provided with a second engaging member; the first and the second engaging members are fixed and engaged with each other manually in a detachable way without any tool so that at least one of the left and the right side walls is connected with the at least one side wall connecting plate in a detachable way.
21. The air conditioner indoor unit according to claim 20, **characterized in that**, one of the first and the second engaging members is a hook and the other one is an adapting hole engaged with the hook.
22. The air conditioner indoor unit according to claim 20, **characterized in that**, one of the first and the second engaging members is a slideway and the other one is a sliding adapting part engaged with the slideway in a sliding way.

23. The air conditioner indoor unit according to claim 20, **characterized in that**, one of the at least one of the left and the right side walls and the at least one of the side wall connecting plates is further provided with an elastic engaging member and the other one of the at least one of the left and the right side walls and the at least one of the side wall connecting plates is further provided with an elastic engaging member adapting part correspondingly; and the elastic engaging member and the elastic engaging member adapting part are fixed and engaged with each other in a detachable way. 5
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24. The air conditioner indoor unit according to claim 23, **characterized in that**, the elastic engaging member adapting part is enclosed by a plurality of limit ribs. 15
25. The air conditioner indoor unit according to claim 18, **characterized in that**, at least one of the left and the right side walls is further provided with a reinforced rib. 20
26. The air conditioner indoor unit according to claim 17, **characterized in that**, the top wall comprises a third engaging member; the top wall connecting plate comprises a fourth engaging member; and the third and the fourth engaging members are fixed and engaged with each other manually in a detachable way without any tool so that the top wall is connected with the top wall connecting plate in a detachable way. 25
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27. The air conditioner indoor unit according to claim 26, **characterized in that**, one of the third and the fourth engaging members is a hook and the other one is an adapting hole engaged with the hook. 35
28. The air conditioner indoor unit according to claim 17, **characterized in that**, the panel body further comprises at least one side wall connecting plate, with which at least one of the left and the right side walls is connected in a detachable way, and the at least one side wall connecting plate and the top wall connecting plate are integrated into a whole. 40
29. The air conditioner indoor unit according to claim 18, **characterized in that**, at least one of the left and the right side walls comprises a base board and a convex board which are connected with each other. 45
30. The air conditioner indoor unit according to any one of claims 2 to 4, **characterized in that**, the whole outer surface of the left side wall is formed by the left convex part; and the whole outer surface of the right side wall is formed by the right convex part. 50
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31. The air conditioner indoor unit according to claim 14, **characterized in that**, the whole outer surface of the top wall is formed by the top convex part.

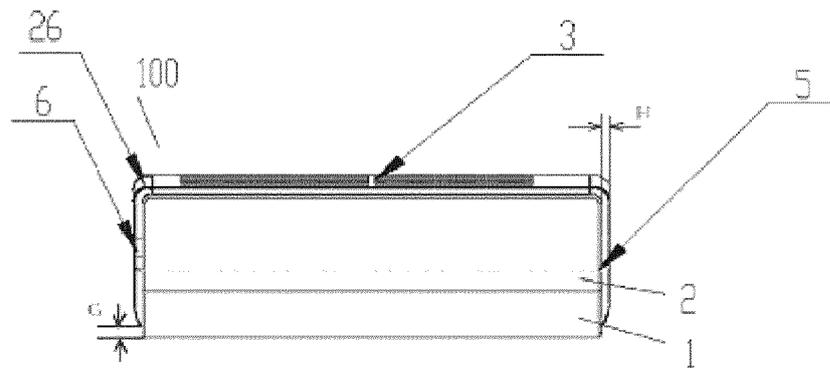


Fig. 1

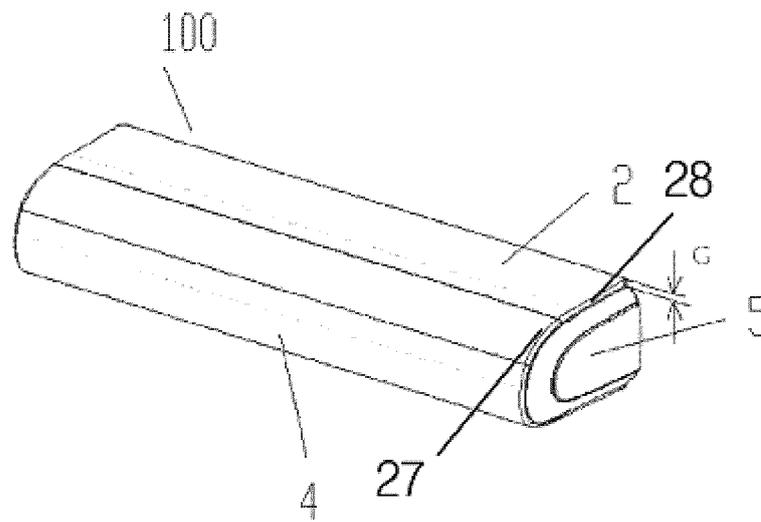


Fig. 2

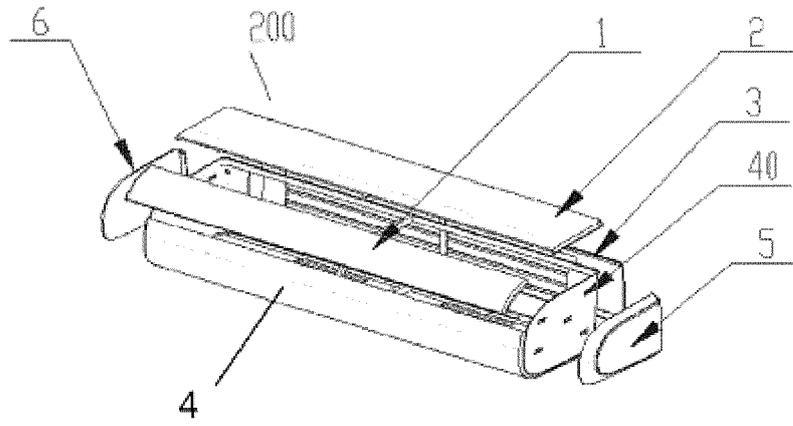


Fig. 3

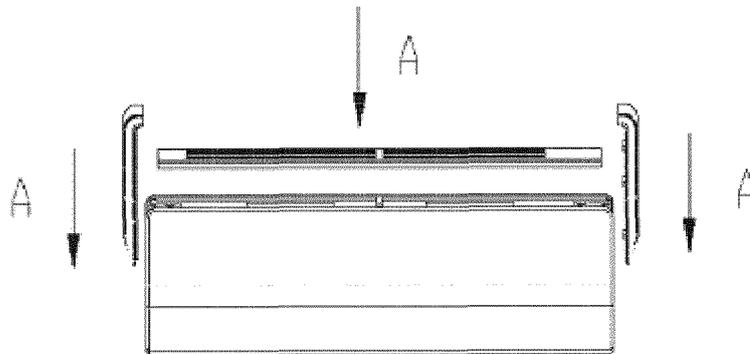


Fig. 4

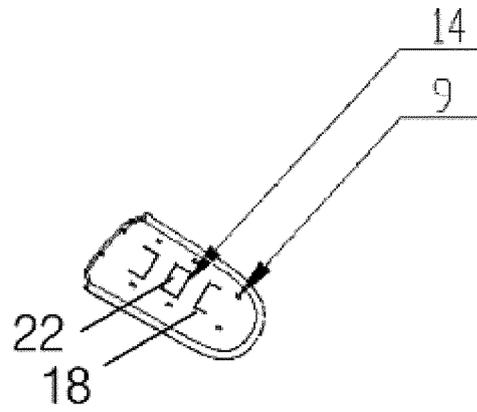


Fig. 5

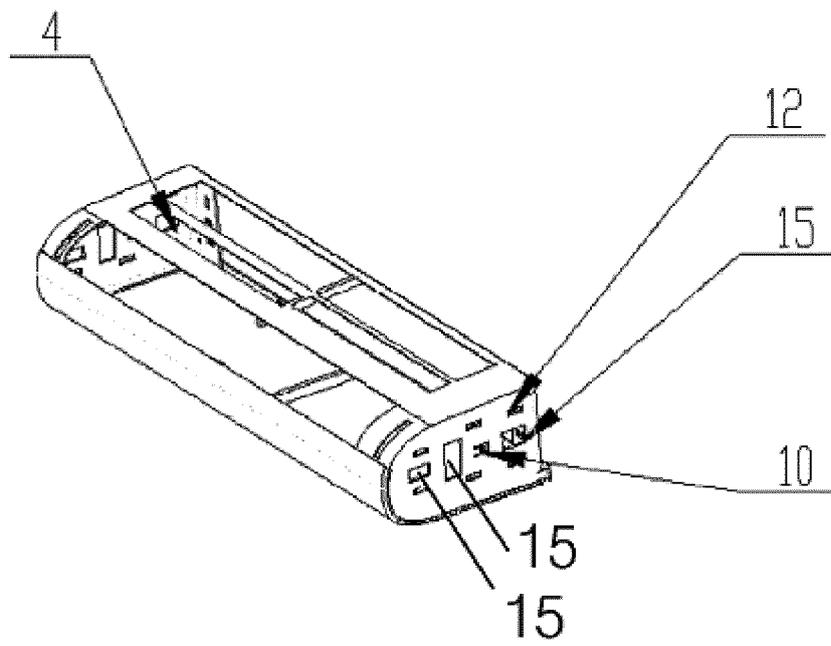


Fig. 6

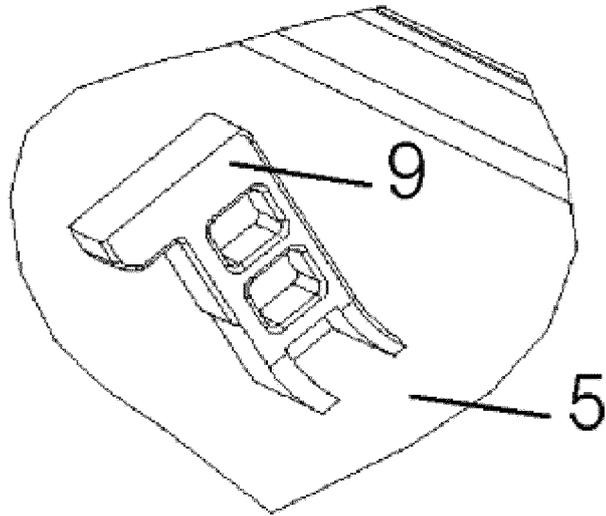


Fig. 7

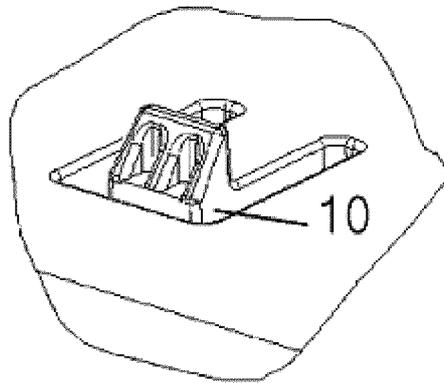


Fig. 8

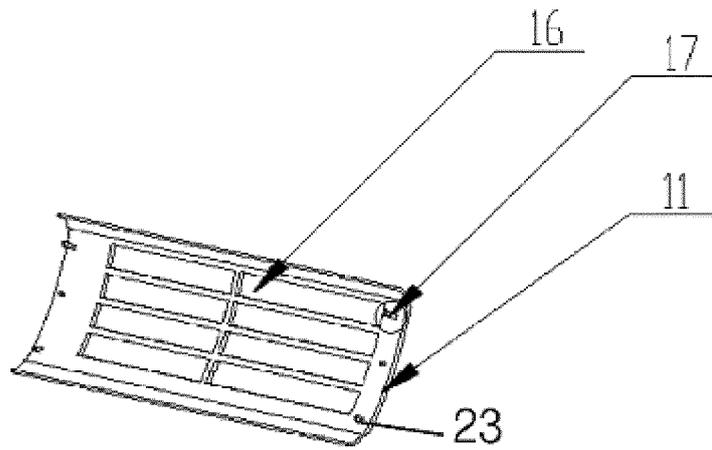


Fig. 9

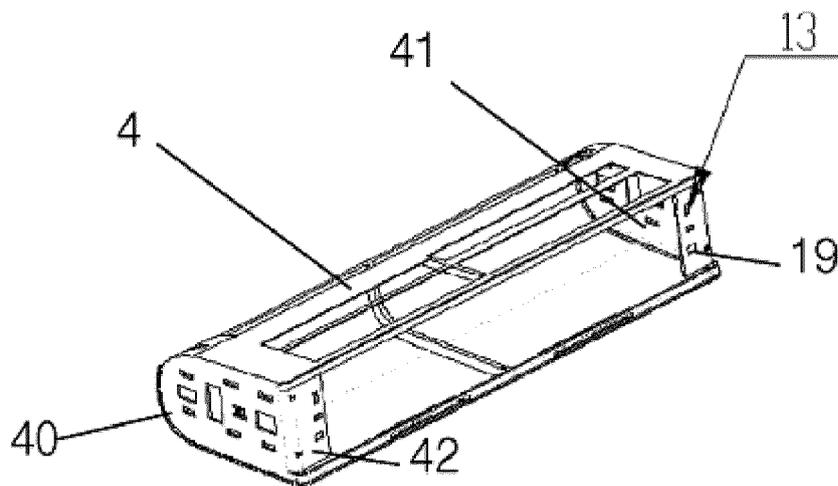


Fig. 10

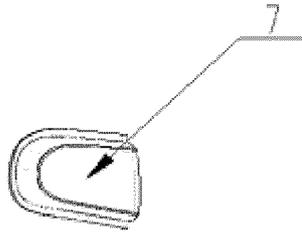


Fig. 11

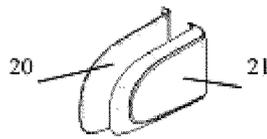


Fig. 12



Fig. 13

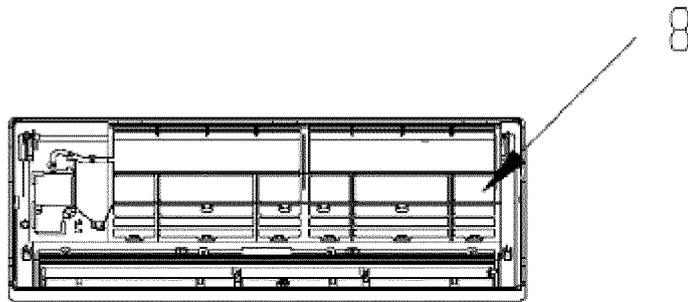


Fig. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2012/078646

A. CLASSIFICATION OF SUBJECT MATTER		
F24F 13/20 (2006.01) i		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC: F24F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CNABS,CNXTX,CNKI,WPI,EPODOC: air, condition+, indoor, protuberan+, handle, knob?, convex, hunch, heave, grip+, mov+, lift+, panel, wall, case, shell, left, right, side, assembl+, disassembl+		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN1932396A(FUJITSU GENERAL LTD)21 Mar. 2007(21.03.2007)description, page 12, line 12 to page 13, line 13 and fig. 1	1-31
Y	CN1517631A(SANYO DENKI KK et al)04 Aug. 2004(04.08.2004)description, page 3, lines 18,19, page 4, lines 1-4 and figures 1-3	1-31
Y	CN2867171Y(LG ELECTRONICS TIANJIN ELECTRIC APPLIANCES INC)07 Feb. 2007(07.02.2007)description, page 2, lines 18-24 and figures 2,3	1
Y	CN101370676A(CARRIER CORP)18 Feb. 2009(18.02.2009)figures 1,2	14-17, 26-28,30,31
PX	CN202267141U(GREE ELECTRIC APPLIANCES INC)06 Jun. 2012(06.06.2012)the whole document	1-31
A	JP11063557A(FUJITSU GENERAL LTD)05 Mar. 1999(05.03.1999)the whole document	1-31
A	CN102087044A(LG ELECTRONICS TIANJIN ELECTRIC APPLIANCES INC)08 Jun. 2011(08.06.2011)the whole document	1-31
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
“A” document defining the general state of the art which is not considered to be of particular relevance	“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
“E” earlier application or patent but published on or after the international filing date	“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	“&”document member of the same patent family	
“O” document referring to an oral disclosure, use, exhibition or other means		
“P” document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search	Date of mailing of the international search report	
10 Oct. 2012(10.10.2012)	25 Oct. 2012(25.10.2012)	
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	Authorized officer WU, Dapeng Telephone No. (86-10) 62084758	

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2012/078646

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CN202267141U	06.06.2012	None	
JP11063557A	05.03.1999	None	
CN102087044A	08.06.2011	None	

Form PCT/ISA /210 (patent family annex) (July 2009)