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(54) **METHOD FOR MOUNTING AIR CONDITIONER AIR OUTLET STRUCTURE AND AIR CONDITIONER AIR OUTLET INSTALLATION STRUCTURE**

(57) The present disclosure discloses a method for mounting an air outlet structure of an air conditioner, comprises the steps of: determining whether the supporting strength of a mounting base satisfies the ceiling requirements of the air outlet structure of the air conditioner; mounting a lateral surface of the air outlet structure of the air conditioner on the mounting base and mounting the air outlet structure of the air conditioner on an indoor unit of the air conditioner if the requirements are satisfied, wherein the mounting base provides a main supporting and the indoor unit provides an auxiliary supporting; mounting the air outlet structure of the air conditioner on the indoor unit and mounting a lateral surface of the air outlet structure of the air conditioner on the mounting base if the requirements are not satisfied, wherein the mounting base provides an auxiliary supporting and the indoor unit provides a main supporting. An air outlet structure of the air conditioner is also provided. The method for mounting the air outlet structure of the air conditioner as well as the mounting structure have a favorable versatility in installation, simplify the installation process of the air outlet structure, and reduce the complexity of the installation.

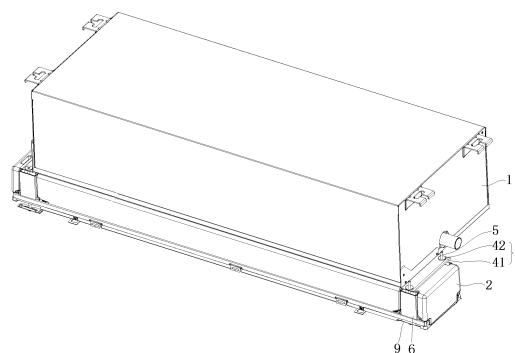


Figure 2

## Description

### CROSS-REFERENCE TO RELATED APPLICATIONS

**[0001]** The present disclosure is based on and claims priority to CN Patent Application No. 201711401437.6 filed on Dec. 22, 2017, the disclosure of which is incorporated by reference herein in its entirety.

### FIELD OF THE INVENTION

**[0002]** The present disclosure relates to the field of an air conditioner device, and in particular, to a method for mounting an outlet structure of the air conditioner and a mounting structure of an air outlet of an air conditioner.

### DESCRIPTION OF RELATED ART

**[0003]** In order to embed the air outlet structure of the air conditioner for the existing ceiling air conditioner into an interior of the ceiling, the air outlet structure of the air conditioner is required to be mounted in the following ten steps: step 1: forming an opening in the ceiling; step 2: providing a sunken platform at the edge of the ceiling; step 3: pasting a masking tape on the inner edge of the air outlet nest; step 4: brushing the glue at the joint between the air outlet nest and the sunken platform at the edge of the ceiling; step 5: fixing the air outlet nest to the ceiling using a nail gun; step 6: supplementing high-strength putty on a periphery of the air outlet nest and the sunk platform of the ceiling; step 7: pasting the jointing paper on the air outlet nest and the edge of the ceiling; step 8: brushing the putty to polish and brushing the paint to level; step 9: removing the masking tape at the inner edge of the air outlet nest and leveling the edge by restoration; step 10: fixing the air outlet member on the air outlet nest with screws.

**[0004]** The inventor has found that, the related art is with at least the following problems: the air outlet member in the related art which uses the above-mentioned mounting manner in a complicated mounting process, involves a number of steps, and a long mounting cycle, so that an emergent engineering project is not satisfied; different steps involve different workers who often have to cooperate with each other, so that it is difficult to ensure the mounting reliability.

### SUMMARY OF THE INVENTION

**[0005]** In the present disclosure, a method for mounting an outlet structure of the air conditioner and a mounting structure of an air outlet of an air conditioner are provided. Wherein, the mounting method comprises the steps of:

determining whether the supporting strength of a mounting base satisfies the ceiling requirements of the air outlet structure of the air conditioner;

mounting a lateral surface of the air outlet structure of the air conditioner on the mounting base and mounting the air outlet structure of the air conditioner on an indoor unit of the air conditioner if the requirements are satisfied, so that the mounting base provides a main support for the air outlet structure of the air conditioner, and the indoor unit provides an auxiliary support for the air outlet structure of the air conditioner; mounting the air outlet structure of the air conditioner on the indoor unit and mounting a lateral surface of the air outlet structure of the air conditioner on the mounting base if the requirements are not satisfied, so that the mounting base provides an auxiliary support for the air outlet structure of the air conditioner and the indoor unit provides a main support for the air outlet structure of the air conditioner.

**[0006]** In one or more embodiments, the step of mounting a lateral surface of the air outlet structure of the air conditioner on the mounting base comprises the following steps:

mounting a fixing member on the lateral surface of the air outlet structure of the air conditioner; wherein the fixing member comprises a first opening and a second opening, and at least one of the first opening and the second opening is an oblong hole; the fixing member is fixed to the lateral surface of the air outlet structure of the air conditioner through the first opening; and fixing the air outlet structure of the air conditioner with the mounting base by passing a fastener through the second opening.

**[0007]** In one or more embodiments, the first opening and the second opening are both oblong holes; a length direction of the first opening is along the first direction of the air outlet structure of the air conditioner; a length direction of the second opening is along the second direction of the air outlet structure of the air conditioner, wherein one of the first direction and the second direction is a longitudinal direction of the air outlet structure of the air conditioner, and the other is a transverse direction of the air outlet structure of the air conditioner.

**[0008]** In one or more embodiments, the step of mounting the air outlet structure of the air conditioner on an indoor unit of the air conditioner comprises the following steps:

mounting a hanging assembly on the indoor unit of the air conditioner; and fixing the air outlet structure of the air conditioner to the hanging assembly.

**[0009]** In some embodiments, an air outlet mounting structure of an air conditioner is provided. The air outlet mounting structure comprises an indoor unit, and an air

outlet structure of the air conditioner. The air outlet structure of the air conditioner is jointly supported by the indoor unit and the mounting base.

**[0010]** In one or more embodiments, a fixing member connecting with the mounting base is mounted on the lateral surface of the air outlet structure of the air conditioner, and a position where the fixing member is connected with the mounting base is adjustable.

**[0011]** In one or more embodiments, the fixing member is configured by an oblong hole to cause the position adjustable.

**[0012]** In one or more embodiments, the fixing member comprises a first opening and a second opening, and at least one of the first opening and the second opening is an oblong hole; the fixing member is fixed to the lateral surface of the air outlet structure of the air conditioner through the first opening; a length direction of the first opening is along the first direction of the air outlet structure of the air conditioner, and a length direction of the second opening is along the second direction of the air outlet structure of the air conditioner, wherein one of the first direction and the second direction is a longitudinal direction of the air outlet structure of the air conditioner, and the other is a transverse direction of the air outlet structure of the air conditioner.

**[0013]** In one or more embodiments, the indoor unit is fixed with a hanging assembly, and the air outlet structure of the air conditioner is fixed to the hanging assembly through a connecting piece.

**[0014]** In one or more embodiments, two opposite sides of the air outlet structure of the air conditioner are mounted on the mounting base, and the other two opposite sides of the air outlet structure of the air conditioner are fixedly connected to the indoor unit 1 through the hanging assembly.

**[0015]** In one or more embodiments, the hanging assembly comprises a connection plate and a nut. The connection plate is detachably connected to the indoor unit. The air outlet structure of the air conditioner is connected to the connection plate through the connecting piece and the nut.

**[0016]** In one or more embodiments, a guide structure is provided on the air outlet structure of the air conditioner to guide a mounting direction of the connecting piece.

**[0017]** In one or more embodiments, the air outlet mounting structure of the air conditioner comprises a stopper disposed on the air outlet structure of the air conditioner, and having a plane clamping the bottom end of the mounting base.

**[0018]** In one or more embodiments, the air outlet mounting structure of the air conditioner comprises a panel disposed on one side of the air outlet structure of the air conditioning facing away from the indoor unit.

**[0019]** In one or more embodiments, the fixing member comprises: a first plate fixed to the air outlet structure of the air conditioner; and a second plate fixed to the first plate and the mounting base.

**[0020]** In one or more embodiments, the comprised

angle between the first plate and the second plate is 95 degrees to 140 degrees.

**[0021]** In one or more embodiments, the total height of the fixing member is 7 mm to 12 mm.

**[0022]** In one or more embodiments, the length of the second opening is 8 mm to 20 mm.

**[0023]** In one or more embodiments, the mounting base comprises a ceiling.

**[0024]** Based on the above-described technical solution, the embodiments of the present disclosure at least have the following technical effects:

the method for mounting an air outlet structure of the air conditioner provided by the present disclosure has a favorable versatility in installation; the mounting requirements are still satisfied even when there is a certain deviation in the opening of the mounting base so that there is no need to rework or re-open the mounting base; the ceiling is reliable and the air outlet structure of the air conditioner is adequately attached to the mounting base; and the installation is simple, and after the opening of the mounting base is accomplished, the installation is performed immediately so that the installation is efficient. The above-described method for mounting the air outlet structure of the air conditioner simplifies the mounting process of the air outlet structure of the air conditioner and reduces the complexity of the mounting operation.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0025]**

Fig. 1 is a schematic flow chart of a method for mounting an outlet structure of an air conditioner according to some embodiments of the present disclosure;

Fig. 2 is a schematic view of fixing an air outlet structure of an air conditioner with an indoor unit according to some embodiments of the present disclosure;

Fig. 3 is a schematic structural view of an air outlet structure of an air conditioner in Fig. 2;

Fig. 4 is a schematic side sectional view at a stopper in Fig. 3;

Fig. 5 is a schematic side sectional view at a fixing member in Fig. 3;

Fig. 6 is a schematic view of mounting an air outlet structure of the air conditioner to a guide structure in Fig. 2;

Fig. 7 is a schematic cross-sectional view of a guide structure in Fig. 6;

Fig. 8 is a schematic view of mounting a guide structure to a fixing member in Fig. 7;

Fig. 9 is a schematic view of an adjustable direction of a fixing plate in Fig. 8;

Fig. 10 is a schematic structural view of a fixing plate in Fig. 8;

Fig. 11 is a first structural schematic view of a fixing member in Fig. 3;

Fig. 12 is a second structural schematic view of a fixing member in Fig. 3;

Fig. 13 is a third structural view of a fixing member in Fig. 3.

## DESCRIPTION OF THE INVENTION

**[0026]** The technical solution provided by the present disclosure will be described in more detail below in conjunction with Figs. 1 to 13.

**[0027]** Referring to Figs. 1 to 13, the embodiments of the present disclosure provide a method for mounting an air outlet structure of an air conditioner, which comprises the following steps:

Step S10: determining whether the supporting strength of a mounting base 10 satisfies the ceiling requirements of the air outlet structure 2 of the air conditioner.

**[0028]** The mounting base 10 is specifically a ceiling. Whether the mounting base 10 meets the ceiling requirements depends on the material, thickness, shape, structure and the like of the mounting base 10. In actual use, after the air outlet structure 2 of the air conditioner is mounted onto the mounting base 10, the entire structure has to be stable and satisfy normal use.

**[0029]** Step S20: mounting a lateral surface of the air outlet structure 2 of the air conditioner on the mounting base 10, wherein the mounting base 10 mainly supports the air outlet structure 2 of the air conditioner; and mounting the air outlet structure 2 of the air conditioner on an indoor unit 1 of the air conditioner, wherein the indoor unit 1 auxiliarily supports the air outlet structure 2 of the air conditioner, if the requirements are satisfied. Wherein, the operation of mounting the lateral surface of the air outlet structure 2 of the air conditioner on the mounting base 10 and the operation of mounting the air outlet structure 2 of the air conditioner on the indoor unit 1 of the air conditioner is, for example, performed sequentially or simultaneously. More operators are required in simultaneous operation, while less operators are required in sequential operation.

**[0030]** In the above-described step S20, the support strength of the mounting base 10 satisfies the requirements. The air outlet structure 2 of the air conditioner is mounted in two manners: directly mounted laterally of the mounting base 10 and directly mounted on the indoor unit 1 of the air conditioner. These two manners are used independently, or combined with other mounting manners to jointly support the weight of the air outlet structure 2 of the air conditioner.

**[0031]** The mounting manner of the lateral surface of the air outlet structure 2 of the air conditioner means that the lateral surface of the air outlet structure 2 of the air conditioner is directly mounted on the mounting base 10 without nesting. Specifically, the lateral surface of the air outlet structure 2 of the air conditioner is directly fixed to the mounting base 10 with screws and plates. The mounting manner described in the embodiments of the air outlet mounting structure of the air conditioner provided below are also used here.

**[0032]** Step S30: mounting the air outlet structure 2 of

the air conditioner on the indoor unit 1 of the air conditioner, wherein the indoor unit 1 mainly supports the air outlet structure 2 of the air conditioner on the indoor unit 1; and mounting a lateral surface of the air outlet structure 2 of the air conditioner on the mounting base 10, wherein the mounting base 10 auxiliarily supports the air outlet structure 2 of the air conditioner if the requirements are not satisfied.

**[0033]** In the method for mounting the air outlet structure of the air conditioner provided by the above-described technical solution, the mounting manner of the air outlet structure 2 of the air conditioner is determined based on whether the supporting capacity of the mounting base 10 itself satisfies the requirements; if the supporting capacity of the mounting base 10 satisfies the requirements, the air outlet structure 2 of the air conditioner is mainly supported by lateral installation (i.e. mounting the lateral surface), so that the weight of the air outlet structure 2 of the air conditioner is dispersed with a number of locations for the mounting site. Moreover, even when the air outlet structure 2 of the air conditioner is long enough, there will be no problems such as deformation. If the supporting capacity of the mounting base 10 does not satisfy the ceiling requirements of the air outlet structure 2 of the air conditioner, the air outlet structure 2 of the air conditioner is mainly supported by the indoor unit 1. The above-described two mounting manners which both eliminate nesting, and thus eliminate complicated steps required in the nested mounting process, simplify the mounting process of the air outlet structure 2 of the air conditioner and improve the mounting efficiency.

**[0034]** The air outlet structure 2 of the air conditioner is supported by the mounting base 10 and the indoor unit 1 at the same time. The above-described mounting manner reduces the number of mounting sites during lateral installation.

**[0035]** The step S20 introduced below specifically comprises the following steps:

First: mounting a fixing member 3 on the lateral surface of the air outlet structure 2 of the air conditioner. Referring to Figs. 3 and 11, the fixing member 3 comprises a first opening 31 and a second opening 32, and at least one of the first opening 31 and the second opening 32 is an oblong hole. The fixing member 3 is fixed to the lateral surface of the air outlet structure 2 of the air conditioner through the first opening 31. If the first opening 31 and the second opening 32 are both oblong holes, the length direction of the first opening 31 is along the first direction of the air outlet structure 2 of the air conditioner, and the length direction of the second opening 32 is along the second direction of the air outlet 2 of the air conditioner. One of the first direction and the second direction is a longitudinal direction of the air outlet structure 2 of the air conditioner, and the other is a transverse direction of the air outlet structure 2 of the air condi-

tioner. The first opening 31 and the second opening 32 are both oblong holes, for adjusting the mounting positions of the fixing member 3 with respect to the mounting base 10 and the air outlet structure 2 of the air conditioner.

Second: fixing the lateral surface of the outlet structure 2 of the air conditioner with the mounting base 10 by passing the fastener 35 through the second opening 32. Referring to Fig. 5, the fastener is, for example, a bolt or the like.

**[0036]** The above-described step S30 specifically comprise the following steps:

First: mounting the hanging assembly 4 on the indoor unit 1 of the air conditioner. There are multiple structures of the hanging assembly 4, such as a plate-like or frame-like structure, and specific structural forms will be given later.

Second: fixing the air outlet structure 2 of the air conditioner to the hanging assembly 4. Referring to Fig. 2, for example, the air outlet structure 2 of the air conditioner is fixed to the hanging assembly 4 by passing a connecting piece 5 from the bottom to the top of the air outlet structure 2 of the air conditioner. Referring to Fig. 2, the connecting piece 5 is a long screw.

**[0037]** The specific embodiments of the above-described method for mounting an air outlet structure of an air conditioner will be introduced below.

**[0038]** First, the lateral installation manner will be introduced. The air outlet structure 2 of the air conditioner introduced is fixed to the mounting base 10 through laterally mounted screws. The air outlet structure of the air conditioner is mounted to the mounting base 10 from bottom to top, and the stopper (designed to be thin, and have sufficient strength) 7 abuts against the lower end surface of the mounting base 10 (see Fig. 4), so that the air outlet structure of the air conditioner is flush with the bottom surface of the mounting base 10. At this time, the fastener (specifically, a laterally mounted screw) 35 is fixed to the mounting base 10 through the second opening 32 (Fig. 11) in the fixing member 3. In some embodiments, the fixing member 3 is also provided with a first opening 31 in a long-waist shape, for the purpose of adjusting the position of the fixing member 3 according to the actual size of the opening of the mounting base 10, so that the laterally mounted screws does not cause deformation of the air outlet structure 2 of the air conditioner when the laterally mounted screws are fastened, thereby ensuring that the shape is not affected.

**[0039]** Next, the ceiling manner will be introduced. The indoor unit 1 is mounted with a hanging assembly 4 (the hanging assembly 4 is provided with a screw hole) 4 in advance, on which a nut 42 for ceiling has been welded in advance. The air outlet structure 2 of the air conditioner is provided with a guide structure 6 which is fixed in many

ways, such as snap-fit, screw fixing, and glue adhering. Of course, it is also possible to directly design features that produce a similar guiding effect on the air outlet structure 2 of the air conditioner. The air outlet structure of the air conditioner is fixed with a stopper 7. The air outlet structure 2 of the air conditioner is fixed with a fixing plate 9 with an adjustable mounting position. The fixing plate 9 is provided with a notch 91 through which the fixing plate 9 is clamped onto the connecting piece 5. See Figs. 3, 9 and 10.

**[0040]** The specific mounting steps are as follows:

(1) first removing the fixing screws on fixing plate 9 (see Fig. 8) with an adjustable position, and placing the fixing plate 9 with an adjustable position into the pocket of an installer for spare use, prior to mounting.  
(2) fixing the two ceiling assemblies 4 by screws on both sides of the indoor unit 1 along a length direction of the indoor unit 1, see Fig. 2.

(3) fixing the connector 5 (specifically a long screw) to the hanging assembly 4 by screwing several threads in advance, when the ceiling screw head is exposed on the bottom surface of the mounting base 10, and the air outlet structure 2 of the air conditioner enables the ceiling screw head to smoothly pass through the inside surface of the guide structure 6 by a guide bevel 61 of the guide structure 6, see Figs. 6 to 8.

(4) abutting the air outlet structure 2 of the air conditioner upwards by hand so that the stopper 7 is attached to the lower end surface of the mounting base 10, after the head of the connecting piece 5 passes through the guide structure 6.

(5) At this time, the installer takes the fixing plate 9 out of the pocket with an adjustable position removed in step 1 (see Figs. 8, 9 and 10). The fixing plate 9 is designed with a notch 91 for clamping a screw, into which the connecting piece 5 is clamped (see the arrow in Fig. 8 for the clamping direction of the fixing plate 9). The fixing plate 9 is designed with a through-hole in a long-waist shape with an adjustable position to ensure that the head of the connecting piece 5 does not pass through the through-hole, and the rod of the connecting piece 5 slides inside the through-hole in a long-waist shape, so as to ensure deviation of the air outlet structure 2 of the air conditioner in a length direction. In addition, for example, a hole in a long-waist shape for adjustment is also provided in a width direction of the fixing plate 9 to ensure that the air outlet structure 2 of the air conditioner is also slightly adjusted in width. For the length and width directions, see the arrows shown in Fig. 10.

finally tightening the connecting piece 5 so that the air outlet structure 2 of the air conditioner is attached to the mounting base 10.

**[0041]** Since the opening of the mounting base 10 is

not necessarily adequately aligned with the air outlet of the air conditioner in the indoor unit 1 during the actual application of construction and installation, the above structure ensures that the ceiling fixation is adapted to most of the construction requirements by delicate designs.

**[0042]** The above is a detailed description of the ceiling mounting manner. During actual application, this ceiling method is suitable for the circumstance that the air outlet structure 2 of the air conditioner itself is very thick. If the air outlet structure 2 of the air conditioner is thin, for example the following mounting manner is specifically used:

- (1) The hanging assembly 4 is fixed on the indoor unit 1.
- (2) The air outlet structure of the air conditioner 2 is mounted against the bottom surface of the mounting base 10. That is, the stopper 7 is attached to the bottom surface of the mounting base 10.
- (3) The connecting piece (specifically including a long screw) 5 is directly aligned with the nut of the hanging assembly 4, and then tightened so that the air outlet structure 2 of the air conditioner is effectively attached to the mounting base 10, and fixed on the indoor unit 1.

**[0043]** It should be noted that, in the above-described ceiling fixing manner, the connecting piece 5 is provided only in a length direction. If the air outlet structure 2 of the air conditioner is long, the air outlet structure 2 of the air conditioner is deformed, which results in deformation of the middle area to expose a gap. Thus, the air outlet structure 2 of the air conditioner is also auxiliarily fixed in the middle position in a laterally mounted screw manner.

**[0044]** In the method for mounting an air outlet structure of an air conditioner provided by the above-described embodiments of the present disclosure, only one mounting manner is used or two mounting manners are used at the same time according to actual demands. The above-described mounting method has a favorable versatility in installation; the installation is still satisfied even when there is a certain deviation in the opening of the mounting base 10 so that there is no need to rework or re-open the mounting base 10. The ceiling is reliable and the air outlet structure 2 of the air conditioner is adequately attached to the mounting base 10; and the installation is simple, and after the opening of the mounting base 10 is accomplished, the installation is performed immediately so that the installation is efficient.

**[0045]** Referring to Fig. 2 to Fig. 11, in some embodiments of the present disclosure, an air outlet mounting structure of an air conditioner is provided. The air outlet mounting structure is used to implement the method for mounting an air outlet structure of the air conditioner provided by the above-described embodiments. The air outlet mounting structure of the air conditioner comprises

an indoor unit 1 and an air outlet structure 2 of the air conditioner. The air outlet structure 2 of the air conditioner is jointly supported by the indoor unit 1 and the mounting base 10.

**[0046]** The mounting base 10 specifically comprise a ceiling. The indoor unit 1 is ceiled on the roof (or referred to as ceiling). According to different actual conditions, the air outlet structure 2 of the air conditioner is supported in one of the following manners: mainly supported by the mounting base 10 and auxiliarily supported by the indoor unit 1; mainly supported by the indoor unit 1 and auxiliarily supported by the mounting base 10.

**[0047]** The air outlet structure 2 of the air conditioner is supported by the indoor unit 1, which avoids problems such as complicated process and required more labor resulting from having to mount the air outlet structure 2 of the air conditioner on the nest fixed to the mounting base 10 in the related art.

**[0048]** In some embodiments, a fixing member 3 for connecting with the mounting base 10 is mounted on the lateral surface of the air outlet structure 2 of the air conditioner, and the position where the fixing member 3 is connected with the mounting base 10 is adjustable.

**[0049]** The fixing member 3 is alternatively mounted to the mounting base 10 by providing a plurality of mounting structures according to actual demands. Alternatively, the fixing member 3 is provided with a hole with an adjustable mounting position, such as an oblong hole, so as to realize an alternative mounting position.

**[0050]** Referring to Fig. 11, in some embodiments, the fixing member 3 comprises a first opening 31 and a second opening 32. At least one of the first opening 31 and the second opening 32 is an oblong hole. Here, take an oblong hole as an example. The fixing member 3 is fixed to the lateral surface of the air outlet structure 2 of the air conditioner through the first opening 31; the length direction of the first opening 31 is along the first direction of the air outlet structure 2 of the air conditioner; the length direction of the second opening 32 is along the second direction of the air outlet structure 2 of the air conditioner, wherein one of the first direction and the second direction is a longitudinal direction of the air outlet structure 2 of the air conditioner, and the other is a transverse direction of the air outlet structure 2 of the air conditioner.

**[0051]** By providing the first opening 31 and the second opening 32 in different length directions, the mounting position is adjusted in the transverse and longitudinal directions of the air outlet structure 2 of the air conditioner, so that the installation is more convenient.

**[0052]** Referring to Fig. 11, the fixing member 3 comprises a first plate 33 and a second plate 34 which are fixed to each other. The first plate 33 is fixed to the air outlet structure 2 of the air conditioner and the second plate 34 is fixed to the mounting base 10. In some embodiments, by way of the above-described structure, the fixing member 3 enables the mounting base 10 to provide an obliquely upward action force on the second plate 34 by using the fastener 35 that normally passes through

the second opening 32. The vertical component comprised in the action force cooperates with the stopper 7 so that the ground of the air outlet structure 2 of the air conditioner is flush with the bottom surface of the mounting base 10. The normally mounted fastener 35 referred thereto means that, with the fastener 35 using a screw as an example, the length direction of the fastener 35 is perpendicular to the second plate 34.

**[0053]** Referring to Fig. 12, the comprised angle between the first plate 33 and the second plate 34 is 95 degrees to 140 degrees, for example 95 degrees, 100 degrees, 105 degrees, 110 degrees, 120 degrees, 130 degrees, 140 degrees, or the like. The comprised angle makes it possible that, when the fastener 35 is mounted, the fixing force F of the fastener 35 is obliquely upward, with an upward component force F 1, and at the same time, the bottom surface of the air outlet structure 2 of the air conditioner is flush with the bottom surface of the mounting base 10 in the case where the stopper 7 limits a position.

**[0054]** Referring to Fig. 12, the total height B of the fixing member 3 is 7 mm to 12 mm. The above-described height satisfies the general thickness of the mounting base, and ensure that it is not too high or exposed to below the mounting base 10.

**[0055]** Referring to Fig. 13, the length C of the second opening 32 is 8 mm to 20 mm. The above-described length ensure that the fastener 35 is mounted nearby when it is not mounted in the original fixing site where it is damaged after the air outlet of the air conditioner is removed.

**[0056]** Referring to Fig. 13, the diameter R of the second opening 32 is 2.5 mm to 4 mm. The diameter R satisfies the size of the screw that is used in the existing construction and installation, whilst ensuring that the screw is not loosely mounted.

**[0057]** Referring to Fig. 13, the distance D from the bottom of the second opening 32 to the bottom is 2 mm to 5 mm, which provides space for the installation of the fastener 35 without interfering with the air outlet structure 2 of the air conditioner.

**[0058]** In some embodiments, the indoor unit 1 is fixed with a hanging assembly 4, and the air outlet structure 2 of the air conditioner is fixed to the hanging assembly 4 through the connecting piece 5. The connecting piece 5 is specifically a long bolt.

**[0059]** Referring to Fig. 2, alternatively, the lateral end surface of the indoor unit 1 is fixedly connected to the air outlet structure 2 of the air conditioner by a hanging assembly 4. The hanging assembly 4 is provided to facilitate the connection between the indoor unit 1 and the air outlet structure 2 of the air conditioner. The hanging assembly 4 is disposed on the transverse end surface of the indoor unit 1, which adequately considers the structural characteristics and the convenient installation of the indoor unit 1.

**[0060]** Referring to Fig. 2, in some embodiments, two opposite sides of the air outlet structure 2 of the air con-

ditioner are mounted on the mounting base 10, and the other two opposite sides of the air outlet structure 2 of the air conditioner are fixedly connected to the indoor unit 1 through the hanging assembly 4. In some embodiments, the two longitudinal sides of the air outlet structure 2 of the air conditioner are mounted on the mounting base 10, and the two transverse sides are hanged on the indoor unit 1.

**[0061]** Referring to Fig. 2, in some embodiments, the hanging assembly 4 comprises a connection plate 41 and a nut 42. The connection plate 41 is detachably connected to the indoor unit 1. The air outlet structure 2 of the air conditioner is connected to the connection plate 41 through the connecting piece 5 and a nut 42. The hanging assembly 4 in the above-described structure has the advantages of compact structure and convenient installation.

**[0062]** Referring to Fig. 2, in order to facilitate mounting the connecting piece 5, the air outlet structure 2 of the air conditioner is provided with a guide structure 6 for guiding a mounting direction of the connecting piece 5. The guide structure 6 is, for example, a bevel or other structure to help the connecting piece 5 locate the screw holes.

**[0063]** Referring to Fig. 7, in some embodiments, the guide structure 6 is provided with, for example, a guide bevel 61 to provide guidance for the connecting piece 5 to locate the connecting plate 41 and the nut 42. The structure which is simple and compact, facilitates the machining and manufacturing.

**[0064]** Referring to Fig. 4, in some embodiments, the air outlet mounting structure of the air conditioner comprises a stopper 7, wherein the stopper 7 is disposed on the air outlet structure 2 of the air conditioner, and the stopper 7 has a plane for clamping the bottom end of the mounting base 10. The stopper 7 is specifically plate-like, wherein one lateral surface of the stopper 7 is mounted to the air outlet structure 2 of the air conditioner, and the other side that is exposed out of the air outlet structure 2 of the air conditioner, is configured to abut against the mounting base 101, and produce a position limiting effect over the installation of the air outlet structure 2 of the air conditioner in a longitudinal direction when the air outlet structure 2 of the air conditioner is mounted, so that the air outlet structure 2 of the air conditioner is not excessively retracted inside the mounting base body 10.

**[0065]** Referring to Fig. 4 or Fig. 5, in some embodiments, the air outlet mounting structure of the air conditioner comprises a panel 8 provided on a lateral side of the air outlet structure 2 of the air conditioner facing away from the indoor unit 1.

**[0066]** The size of the panel 8 is greater than or equal to that of the opening of the mounting base 10, so that the panel 8 blocks the mounting position of the air outlet structure 2 of the air conditioner and makes a lower accuracy of the mounting position.

**[0067]** In the description of the present disclosure, it is necessary to understand that, the azimuth or positional

relations indicated by the terms "center", "longitudinal", "transverse", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "within", "outside", which are based on the azimuth or positional relations illustrated by the drawings, are only for facilitating description of the present disclosure, rather than indicating or implying that the device or element referred thereto has to present a particular azimuth, and be constructed and operated in a particular azimuth, so that it does not understand as limiting the protection scope of the present disclosure.

**[0068]** Finally, it should be explained that: the aforementioned embodiments are only used to describe the technical solution of the present disclosure rather than limiting the same; although detailed explanations are made to the present disclosure by referring to preferred embodiments, a common technical person in the art should understand that: it is still possible to make amendments to the embodiments of the present disclosure or make equivalent replacements to part of the technical features; without departing from the spirit and scope of the present disclosure, they should all be covered in the scope of the technical solution for which protection is sought in the present disclosure.

## Claims

1. A method for mounting an air outlet structure of an air conditioner, comprising the steps of:

determining whether the supporting strength of a mounting base satisfies the ceiling requirements of the air outlet structure of the air conditioner;  
mounting a lateral surface of the air outlet structure of the air conditioner on the mounting base and mounting the air outlet structure of the air conditioner on an indoor unit of the air conditioner if the requirements are satisfied, so that the mounting base provides a main support for the air outlet structure of the air conditioner, and the indoor unit provides an auxiliary support for the air outlet structure of the air conditioner; mounting the air outlet structure of the air conditioner on the indoor unit and mounting a lateral surface of the air outlet structure of the air conditioner on the mounting base if the requirements are not satisfied, so that the mounting base provides an auxiliary support for the air outlet structure of the air conditioner and the indoor unit provides a main support for the air outlet structure of the air conditioner.

2. The method for mounting an air outlet structure of an air conditioner according to claim 1, wherein the step of mounting a lateral surface of the air outlet structure of the air conditioner on the mounting base comprises the following steps:

mounting a fixing member on the lateral surface of the air outlet structure of the air conditioner; wherein the fixing member comprises a first opening and a second opening, and at least one of the first opening and the second opening is an oblong hole; the fixing member is fixed to the lateral surface of the air outlet structure of the air conditioner through the first opening; and fixing the air outlet structure of the air conditioner with the mounting base by passing a fastener through the second opening.

3. The method for mounting an air outlet structure of an air conditioner according to claim 1, wherein the first opening and the second opening are both oblong holes; a length direction of the first opening is along the first direction of the air outlet structure of the air conditioner; a length direction of the second opening is along the second direction of the air outlet structure of the air conditioner, wherein one of the first direction and the second direction is a longitudinal direction of the air outlet structure of the air conditioner, and the other is a transverse direction of the air outlet structure of the air conditioner.

4. The method for mounting an air outlet structure of an air conditioner according to claim 1, wherein the step of mounting the air outlet structure of the air conditioner on an indoor unit of the air conditioner comprises the following steps:

mounting a hanging assembly on the indoor unit of the air conditioner; and  
fixing the air outlet structure of the air conditioner to the hanging assembly.

5. An air outlet mounting structure of an air conditioner, **characterized by** comprising:

an indoor unit (1); and  
an air outlet structure (2) of the air conditioner, which is jointly supported by the indoor unit (1) and a mounting base (10).

6. The air outlet mounting structure of the air conditioner according to claim 5, wherein a fixing member (3) connecting with the mounting base (10) is mounted on the lateral surface of the air outlet structure (2) of the air conditioner, and a position where the fixing member (3) is connected with the mounting base (10) is adjustable.

7. The air outlet mounting structure of the air conditioner according to claim 6, wherein the fixing member (3) is configured by an oblong hole to cause the position adjustable.

8. The air outlet mounting structure of the air condition-



- er according to claim 7, wherein the fixing member (3) comprises a first opening (31) and a second opening (32), and at least one of the first opening (31) and the second opening (32) is an oblong hole; the fixing member (3) is fixed to the lateral surface of the air outlet structure (2) of the air conditioner through the first opening (31); a length direction of the first opening (31) is along the first direction of the air outlet structure (2) of the air conditioner, and a length direction of the second opening (32) is along the second direction of the air outlet structure (2) of the air conditioner, wherein one of the first direction and the second direction is a longitudinal direction of the air outlet structure (2) of the air conditioner, and the other is a transverse direction of the air outlet structure (2) of the air conditioner.
9. The air outlet mounting structure of the air conditioner according to claim 5, wherein the indoor unit (1) is fixed with a hanging assembly (4), and the air outlet structure (2) of the air conditioner is fixed to the hanging assembly (4) through a connecting piece (5).
10. The air outlet mounting structure of the air conditioner according to claim 9, wherein two opposite sides of the air outlet structure (2) of the air conditioner are mounted on the mounting base (10), and the other two opposite sides of the air outlet structure (2) of the air conditioner are fixedly connected to the indoor unit (1) through the hanging assembly (4).
11. The air outlet mounting structure of the air conditioner according to claim 10, wherein the hanging assembly (4) comprises:
- a connection plate (41) detachably connected to the indoor unit (1); and
  - a nut (42), wherein the air outlet structure (2) of the air conditioner is connected to the connection plate (41) through the connecting piece (5) and the nut (42).
12. The air outlet mounting structure of the air conditioner according to claim 5, wherein a guide structure (6) is provided on the air outlet structure (2) of the air conditioner to guide a mounting direction of the connecting piece (5).
13. The air outlet mounting structure of the air conditioner according to claim 5, comprises:
- a stopper (7) disposed on the air outlet structure (2) of the air conditioner, and having a plane clamping the bottom end of the mounting base (10).
14. The air outlet mounting structure of the air conditioner according to claim 5, comprises:
- a panel (8) disposed on one side of the air outlet structure (2) of the air conditioning facing away from
- the indoor unit (1).
15. The air outlet mounting structure of the air conditioner according to claim 6, wherein the fixing member (3) comprises:
- a first plate (33) fixed to the air outlet structure (2) of the air conditioner; and
  - a second plate (34) fixed to the first plate (33) and the mounting base (10).
16. The air outlet mounting structure of the air conditioner according to claim 15, wherein the included angle between the first plate (33) and the second plate (34) is 95 degrees to 140 degrees.
17. The air outlet mounting structure of the air conditioner according to claim 6, wherein the total height of the fixing member (3) is 7 mm to 12 mm.
18. The air outlet mounting structure of the air conditioner according to claim 7, wherein the length of the second opening (32) is 8 mm to 20 mm.
19. The air outlet mounting structure of the air conditioner according to claim 5, wherein the mounting base (10) comprises a ceiling.

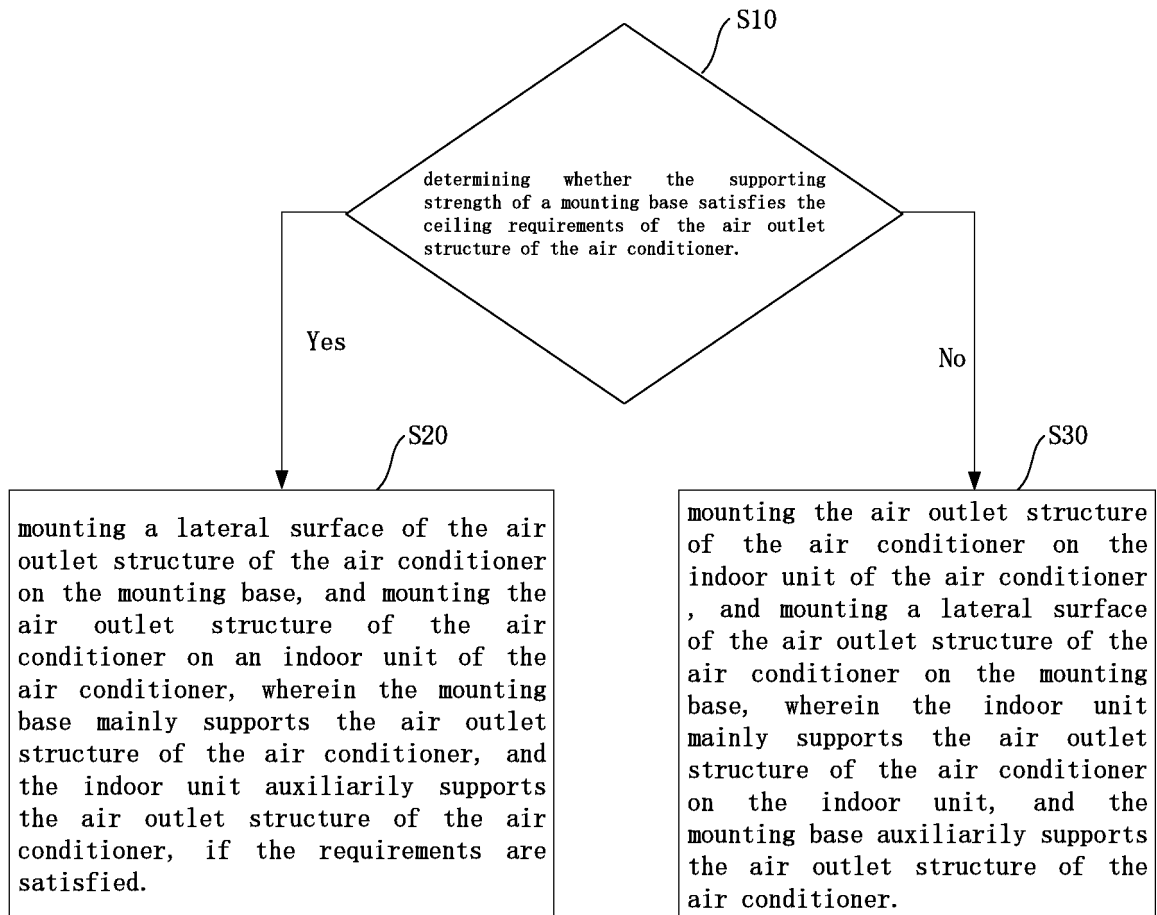


Figure 1

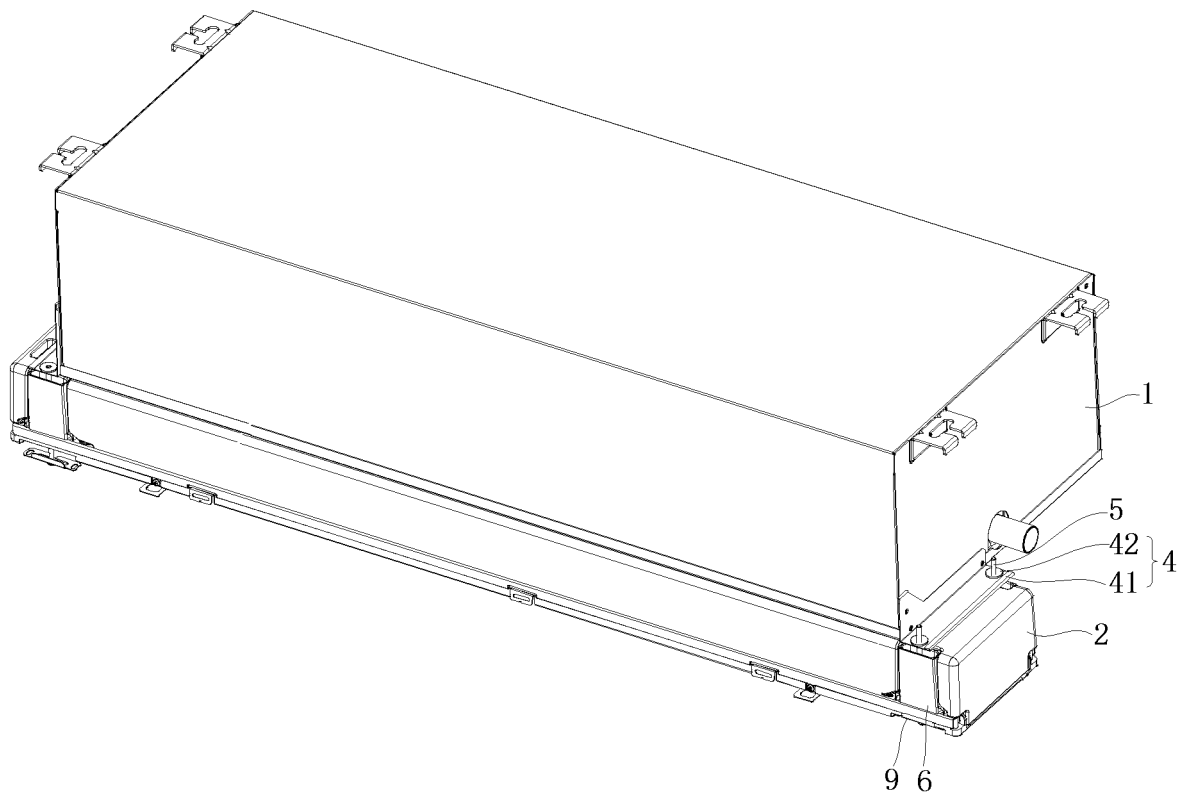


Figure 2

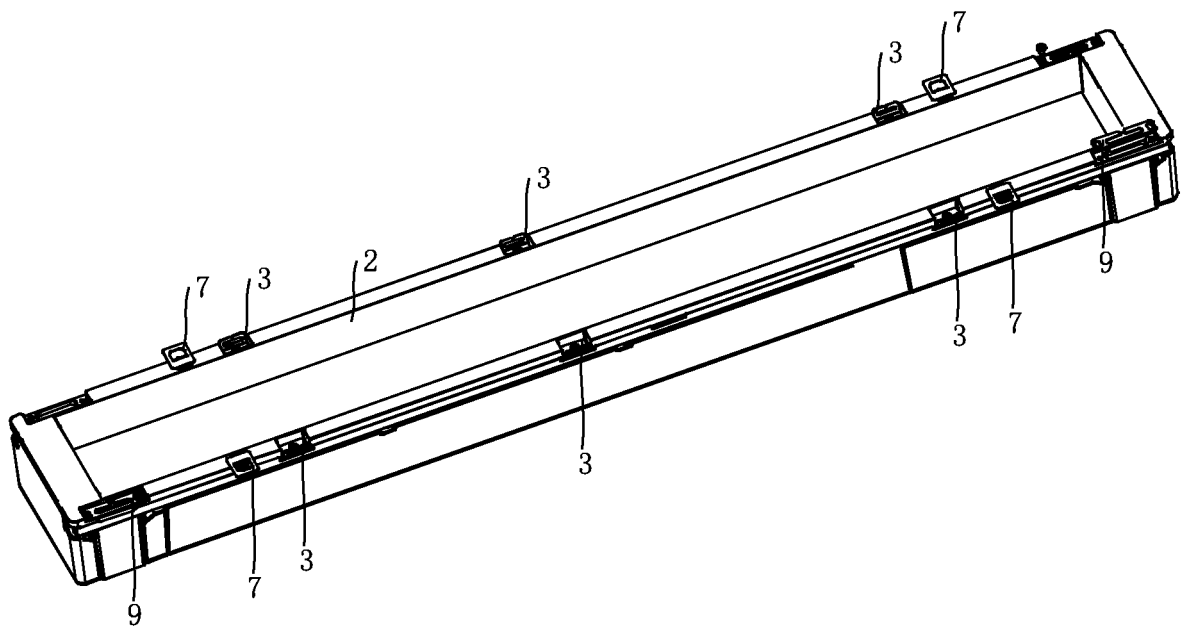


Figure 3

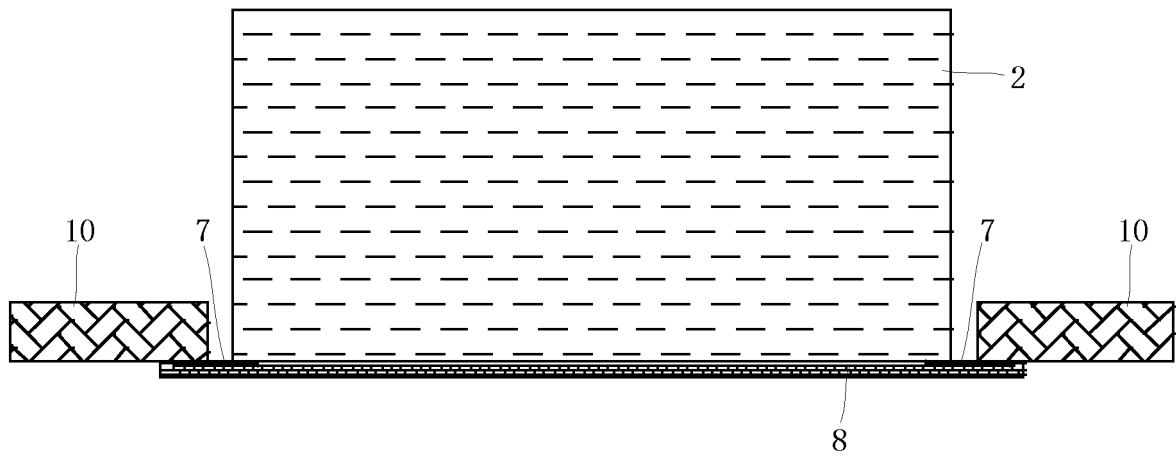


Figure 4

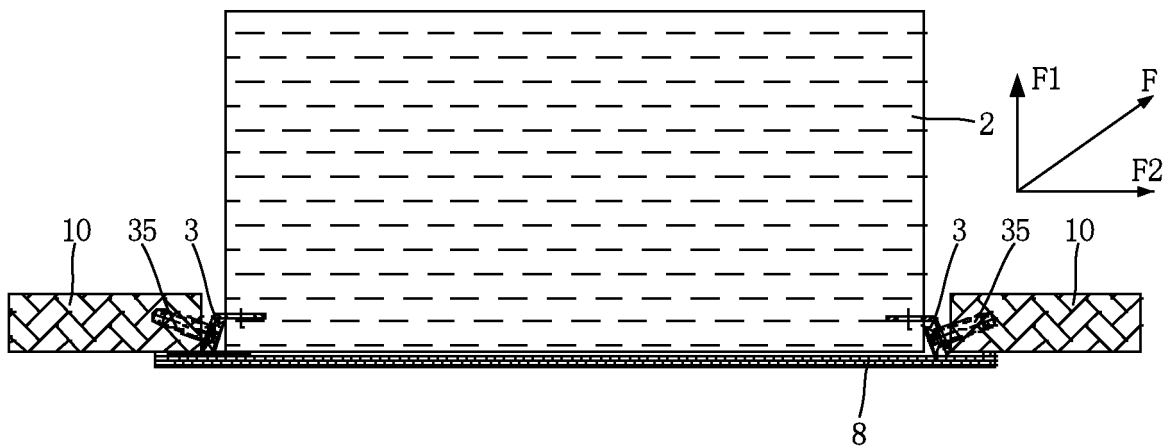


Figure 5

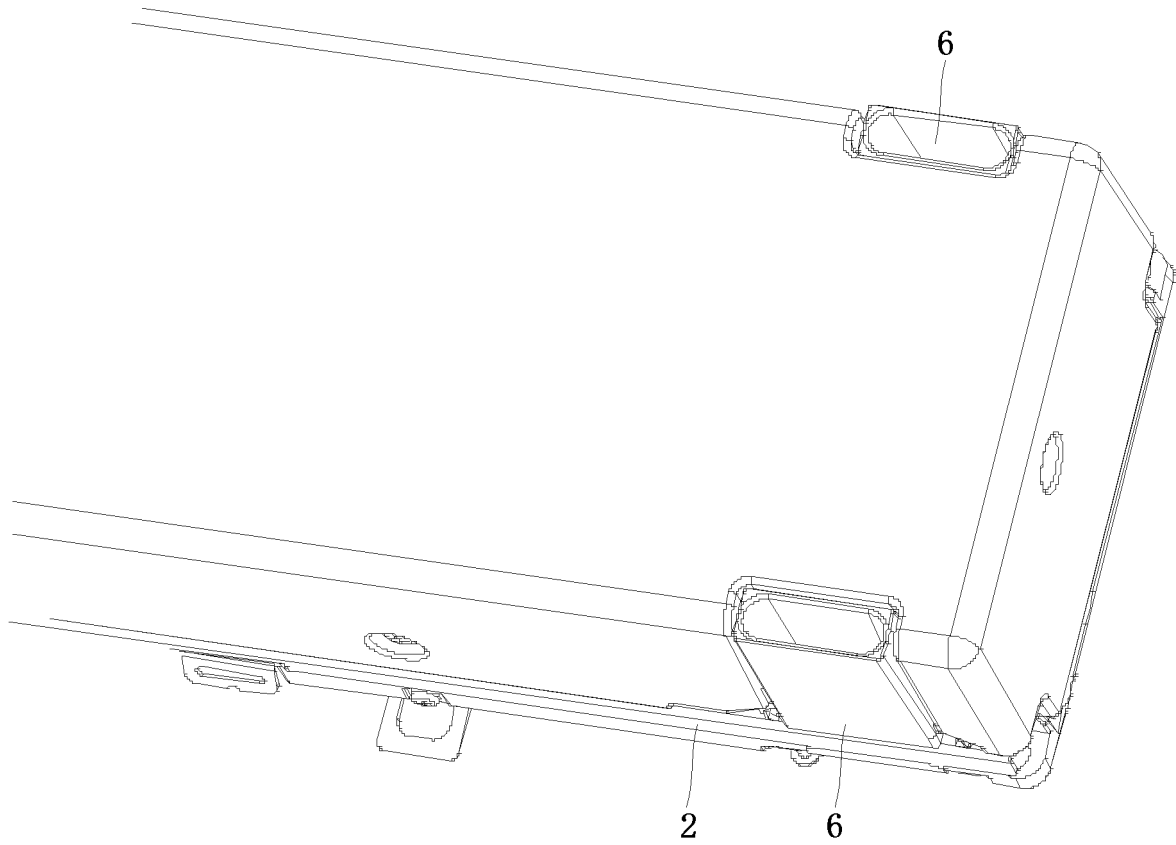


Figure 6

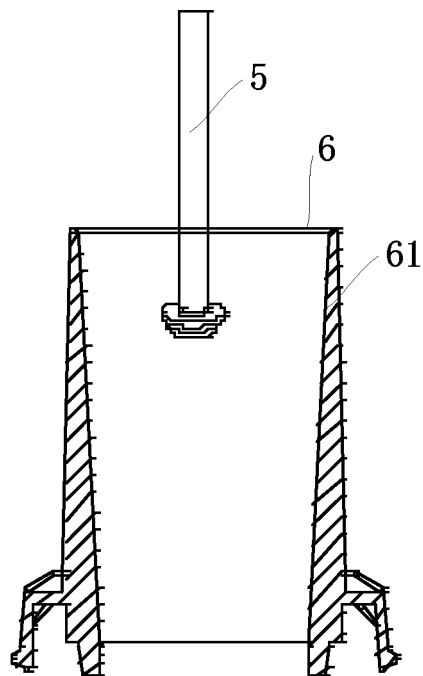


Figure 7

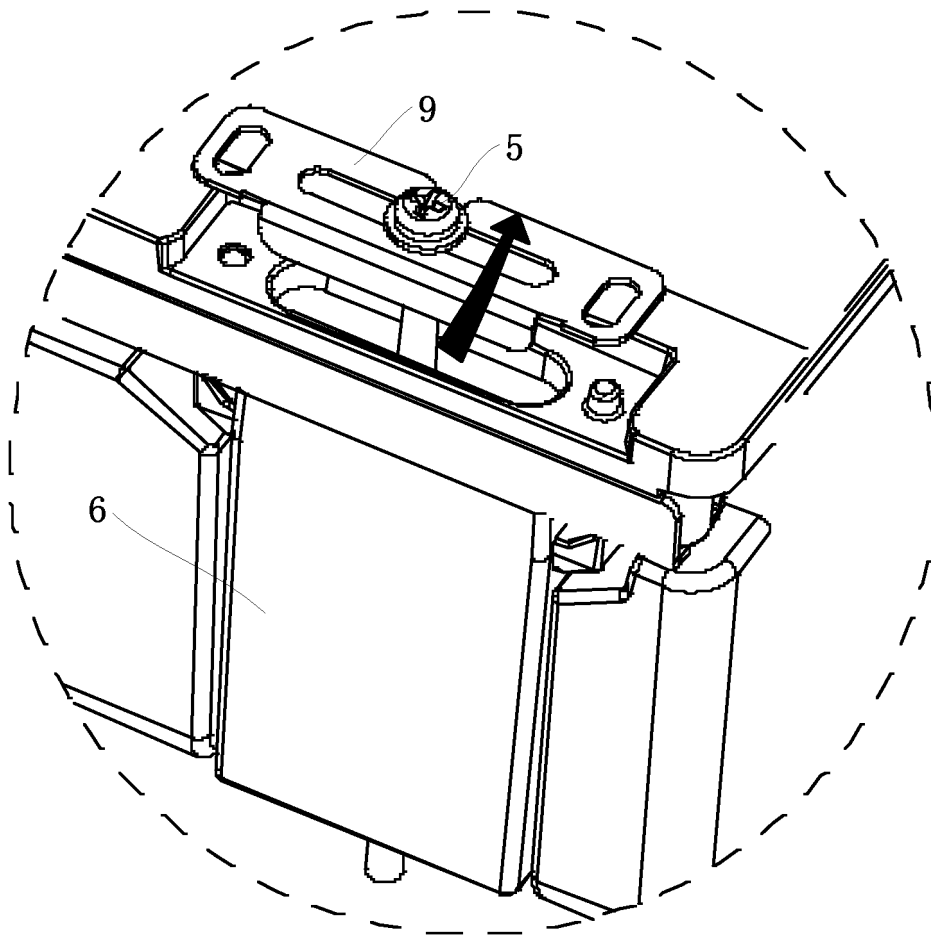


Figure 8

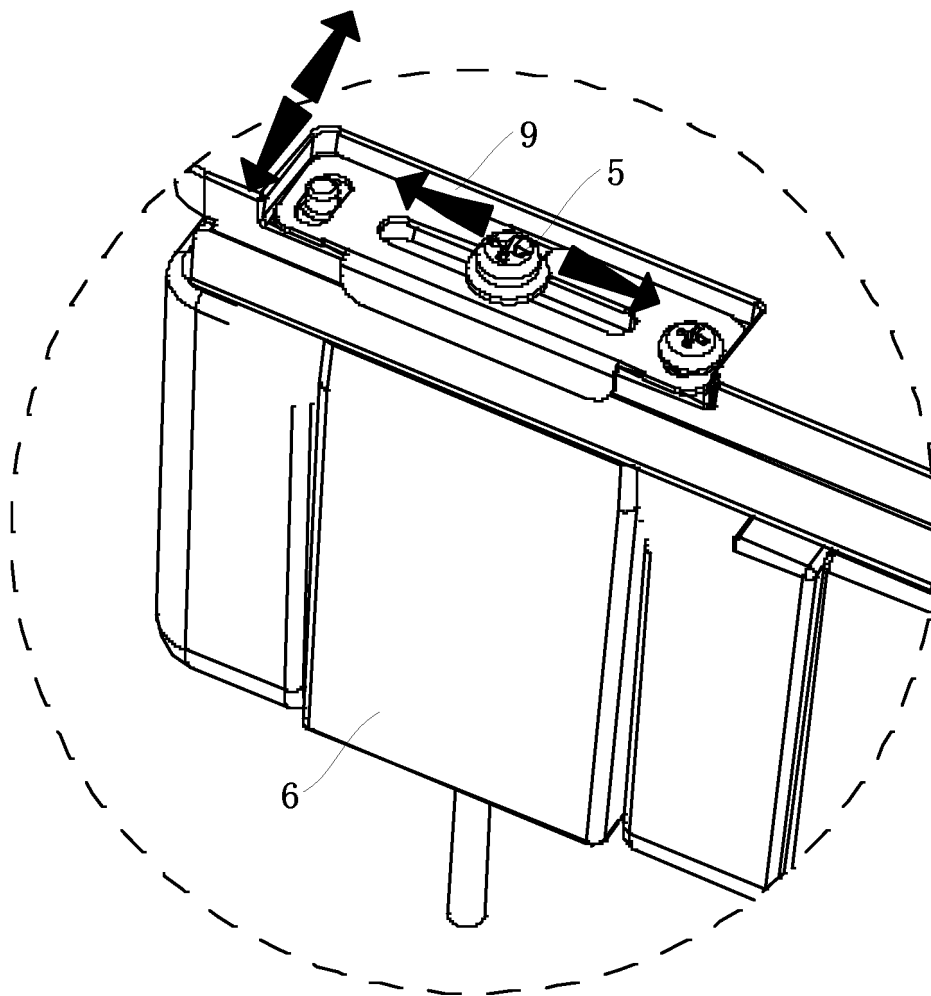


Figure 9

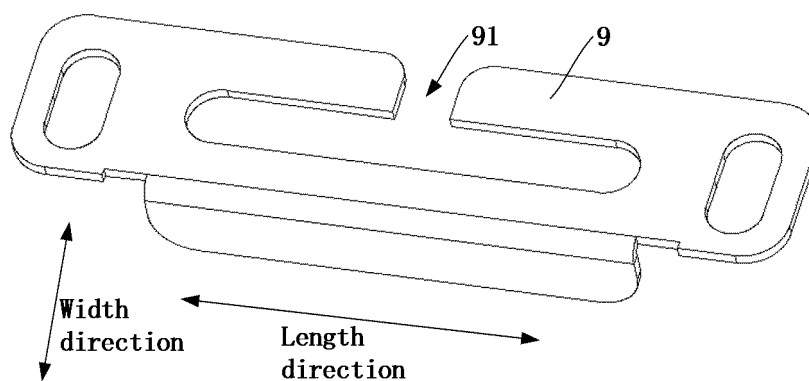


Figure 10

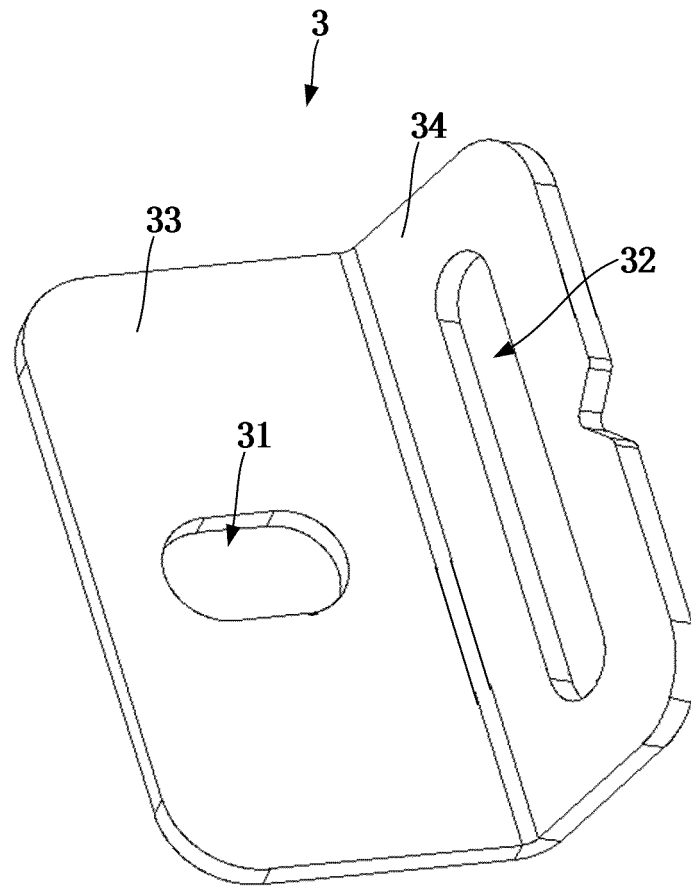


Figure 11

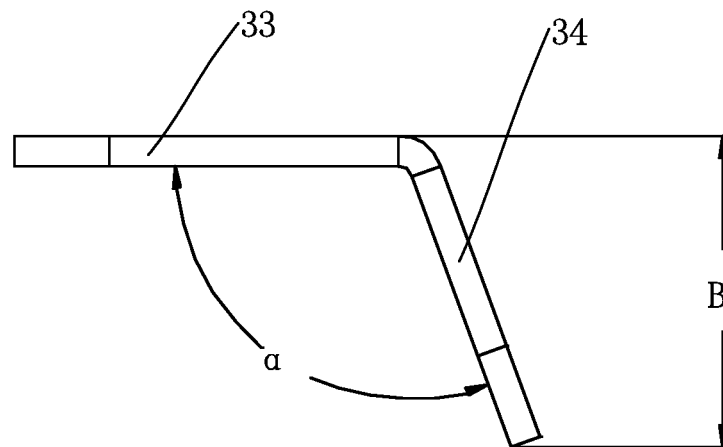


Figure 12



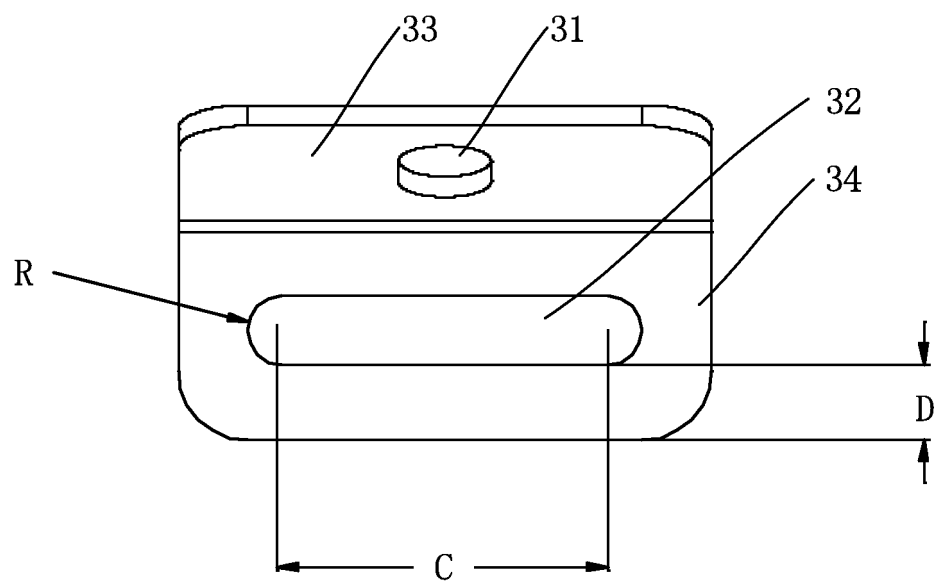


Figure 13

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/103735

## A. CLASSIFICATION OF SUBJECT MATTER

F24F 13/06(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)

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, CNKI, DWPI, SIPOABS, EPODOC: 空调, 出风口, 安装, 吊顶, 基体, air w conditioner, outlet, assemble, fit+, fix, ceiling, base, basal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 107940712 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 20 April 2018 (2018-04-20) claims 1-19	1-19
E	CN 208042459 U (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 02 November 2018 (2018-11-02) description, paragraphs [0040]-[0093], and figures 1-13	1-19
X	CN 104019536 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 03 September 2014 (2014-09-03) description, paragraphs [0028]-[0056], and figures 1-6	5-7, 9-14, 17-19
A	CN 104019536 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 03 September 2014 (2014-09-03) description, paragraphs [0028]-[0056], and figures 1-6	1-4, 8, 15, 16
X	CN 204165215 U (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 18 February 2015 (2015-02-18) description, paragraphs [0023]-[0051], and figures 1-6	5-7, 9-14, 17-19

☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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Date of the actual completion of the international search

09 November 2018

Date of mailing of the international search report

23 November 2018

Name and mailing address of the ISA/CN

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Authorized officer

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INTERNATIONAL SEARCH REPORT

International application No. <b>PCT/CN2018/103735</b>
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5	<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.

**PCT/CN2018/103735**

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