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(54) **INDOOR UNIT OF WALL-MOUNTED AIR CONDITIONER AND WALL-MOUNTED AIR
CONDITIONER**

(57) Disclosed includes a wall-mounted air conditioner indoor unit and a wall-mounted air conditioner. The wall-mounted air conditioner indoor unit includes a chassis, a heat exchanger, and an air outlet frame. The chassis has an upper and a lower end in a width thereof and is provided with two baffle plates extending vertically and facing each other. Each of the two baffle plates has an inner surface in which is defined a first sliding groove having a groove bottom that faces the other baffle plate and is partially recessed to define a second sliding groove. The heat exchanger is mounted on the chassis. The chassis, the two baffle plates, and the heat exchang-

er collectively enclose an air duct cavity with a downward opening. The air outlet frame is provided for mounting a cross flow fan. A first sliding block and a second sliding block are arranged on each of opposite ends of the air outlet frame that lie in a length of the chassis. The air outlet frame is detachably mounted onto each of the two baffle plates and within the air duct cavity by the fitting of the first sliding groove and the first sliding block as well as the fitting of the second sliding groove and the second sliding block. The disclosed technical solution reduces the difficulty in removal of the cross flow fan.

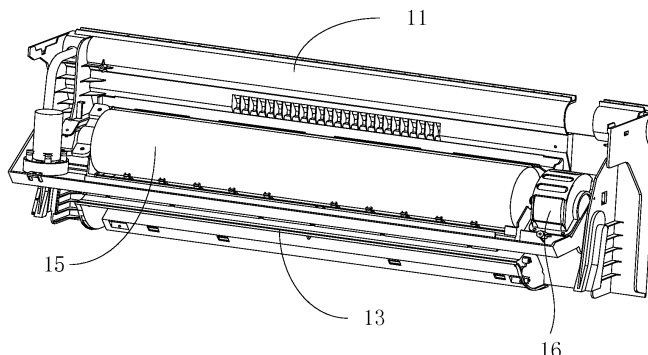


FIG. 2

Description

TECHNICAL FIELD

5 **[0001]** The present invention relates generally to the technical field of air conditioning, and more particularly relates to a wall-mounted air conditioner indoor unit and a wall-mounted air conditioner.

BACKGROUND

10 **[0002]** A typical wall-mounted air conditioner indoor unit generally includes a chassis, a heat exchanger, a cross flow fan, and other air duct components. Since during the long term working process of the wall-mounted air conditioner indoor unit, dust can be easily deposited on the cross flow fan, the cross flow fan needs to be cleaned on a regular basis.
[0003] To do this, with an existing wall-mounted air conditioner indoor unit, the heat exchanger needs to be first detached to expose the cross flow fan before the cross flow fan can be removed. During this process, however, it is
 15 troublesome to remove and install the heat exchanger, and this makes it inconvenient for the detachment of the cross flow fan.

SUMMARY

20 **[0004]** It is therefore one main object of the present invention to provide a wall-mounted air conditioner indoor unit to reduce the difficulty in the removal of the cross flow fan when the interior of the wall-mounted air conditioner indoor unit needs to be cleaned.

[0005] To achieve the above object, the wall-mounted air conditioner indoor unit provided by the present invention includes a chassis, a heat exchanger, and an air outlet frame. The chassis has an upper and a lower end in a width
 25 thereof, and is provided with two baffle plates extending vertically and facing each other. Each of the two baffle plates has an inner surface in which is defined a first sliding groove having a groove bottom, with the groove bottom facing the other baffle plate and partially recessed to define a second sliding groove. The heat exchanger is mounted on the chassis. The chassis, the two baffle plates, and the heat exchanger collectively enclose an air duct cavity with a downward
 30 opening. The air outlet frame is used for mounting a cross flow fan. A first sliding block and a second sliding block are arranged on each of opposite ends of the air outlet frame that lie in a length of the chassis. The air outlet frame is detachably mounted onto each of the two baffle plates within the air duct cavity by the fitting of the first sliding groove and the first sliding block and the fitting of the second sliding groove and the second sliding block.

[0006] In some embodiments, the first sliding block on each of the baffle plates has an end surface facing the other baffle plate, and the second sliding block on the baffle plate is formed by partially protruding from an edge portion of the
 35 end surface. The second sliding block and the first sliding block are arranged eccentric in relation to each other.

[0007] In some embodiments, an end surface of one end of the first sliding block and the air outlet frame is provided with a locking groove, or a locking groove is defined along a circumference of the first sliding block. Sidewalls enclosing the first sliding groove are provided with inward flanges that extend into the locking groove to be interlocked with the first sliding block.

40 **[0008]** In some embodiments, one or more rotating balls are provided on at least one wall surface of the first sliding block facing the inner walls of the first sliding groove. Alternatively or additionally, one or more rotating balls are provided on at least one wall surface of the second sliding block facing the inner walls of the second sliding groove.

[0009] In some embodiments, the first sliding groove and the second sliding groove run parallel with each other and both the first and second sliding grooves are linearly arranged.

45 **[0010]** In some embodiments, both the first sliding groove and the second sliding groove each make an angle of more than or equal to 10° and less than or equal to 30° with respect to the vertical direction.

[0011] In some embodiments, the first sliding groove has a first notch penetrating through the lower end of the corresponding baffle plate, and the second sliding groove has a second notch that penetrates through the lower end of the corresponding baffle plate. The first notch and/or the second notch are flared.

50 **[0012]** In some embodiments, the first sliding groove includes first sidewalls that extend toward the lower end of the baffle plate and a first guide wall that is located at the first notch and connected to one of the first sidewalls. The first guide wall and the first sidewall make an angle of more than or equal to 3° and less than or equal to 10°. Alternatively or additionally, the second sliding groove includes a second sidewall that extends toward the lower end of the baffle plate and a second guide wall that is located at the second notch and connected to the second sidewall. The second
 55 guide wall and the second sidewall make an angle of more than or equal to 3° and less than or equal to 10°.

[0013] In some embodiments, the air outlet frame includes a frame body for mounting the cross flow fan, a volute tongue, a water receiving groove connected to the volute tongue, and an air deflector mounting support connected to the volute tongue. The frame body, the volute tongue, the water receiving groove, and the air deflector mounting support

are integrally formed with each other.

[0014] In some embodiments, the inner surface of each of the baffle plates is provided with a spring latch, and both ends of the air outlet frame are each provided with a positioning slot. The air outlet frame is thus limited and installed within the air duct cavity through the interlocking of the spring latch and the positioning slot.

[0015] In some embodiments, the wall-mounted air conditioner indoor unit has an electric fan motor connected to the cross flow fan and mounted on the air outlet frame.

[0016] In some embodiments, the chassis includes a bottom plate having an upper end recessed towards the air duct cavity to define a pipe guiding groove extending in a length of the chassis.

[0017] The present invention further provides a wall-mounted air conditioner including a wall-mounted air conditioner indoor unit. The wall-mounted air conditioner indoor unit includes a chassis, a heat exchanger, and an air outlet frame. The chassis has an upper and a lower end in a width thereof, and is provided with two baffle plates extending vertically and facing each other. Each of the two baffle plates has an inner surface in which is defined a first sliding groove having a groove bottom. The groove bottom faces the other baffle plate, and is partially recessed to define a second sliding groove. The heat exchanger is mounted on the chassis. The chassis, the two baffle plates, and the heat exchanger collectively enclose an air duct cavity with a downward opening. The air outlet frame is used for mounting a cross flow fan. A first sliding block and a second sliding block are arranged on each of opposite ends of the air outlet frame that lie in a length of the chassis. The air outlet frame is detachably mounted onto each of the two baffle plates within the air duct cavity by the fitting of the first sliding groove and the first sliding block and the fitting of the second sliding groove and the second sliding block.

[0018] In some embodiments, the first sliding block on each of the two baffle plates has an end surface facing the other baffle plate, and the second sliding block on the baffle plate is formed by partially protruding from an edge portion of the end surface. The second sliding block and the first sliding block are arranged eccentric in relation to each other.

[0019] In some embodiments, an end surface of one end of the first sliding block and the air outlet frame is provided with a locking groove, or a locking groove is defined along a circumference of the first sliding block. Side walls enclosing the first sliding groove are provided with inward flanges that extend into the locking groove to be interlocked with the first sliding block.

[0020] In some embodiments, one or more rotating balls are provided on at least one wall surface of the first sliding block facing the inner walls of the first sliding groove. Alternatively or additionally, one or more rotating balls are provided on at least one wall surface of the second sliding block facing the inner walls of the second sliding groove.

[0021] In some embodiments, the first sliding groove and the second sliding groove run parallel with each other and both the first sliding groove and the second sliding groove are linearly arranged.

[0022] In some embodiments, both the first sliding groove and the second sliding groove each make an angle of more than or equal to 10° and less than or equal to 30° with respect to the vertical direction.

[0023] In some embodiments, the first sliding groove has a first notch penetrating through the lower end of the corresponding baffle plate, and the second sliding groove has a second notch that penetrates through the lower end of the corresponding baffle plate. The first notch and/or the second notch are flared.

[0024] In some embodiments, the first sliding groove includes first sidewalls that extend toward the lower end of the baffle plate and a first guide wall that is located at the first notch and connected to one of the first sidewalls. The first guide wall and the first sidewall make an angle of more than or equal to 3° and less than or equal to 10° . Alternatively or additionally, the second sliding groove includes a second sidewall that extends toward the lower end of the baffle plate and a second guide wall that is located at the second notch and connected to the second sidewall. The second guide wall and the second sidewall make an angle of more than or equal to 3° and less than or equal to 10° .

[0025] In some embodiments, the air outlet frame includes a frame body for mounting the cross flow fan, a volute tongue, a water receiving groove connected to the volute tongue, and an air deflector mounting support connected to the volute tongue. The frame body, the volute tongue, the water receiving groove, and the air deflector mounting support are integrally formed with each other.

[0026] In some embodiments, the inner surface of each of the baffle plates is provided with a spring latch, and both ends of the air outlet frame are each provided with a positioning slot. The air outlet frame is thus limited and installed within the air duct cavity through the interlocking of the spring latch and the positioning slot.

[0027] In some embodiments, the wall-mounted air conditioner indoor unit has an electric fan motor connected to the cross flow fan and mounted on the air outlet frame.

[0028] In some embodiments, the chassis includes a bottom plate having an upper end recessed towards the air duct cavity to define a pipe guiding groove extending in a length of the chassis.

[0029] In the technical solution according to the present invention, a first sliding groove and a second sliding groove are arranged on each of the two baffle plates that enclose the air duct cavity, and a first sliding block adapted to be fitted with the first sliding groove as well as a second sliding block adapted to be fitted with the second sliding block are provided on each of both ends of the air outlet frame. Thus, to disassemble the cross flow fan, the user needn't remove the heat exchanger, but needs only to slide the air outlet frame out of the air duct cavity, so the difficulty of detaching

the cross flow fan is greatly reduced.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0030] To better illustrate the technical solutions according to various embodiments of the present invention or the prior art, the accompanying drawings intended for facilitating the description of the embodiments herein or the prior art will now be briefly described. It is evident that the accompanying drawings introduced in the following description illustrate merely some embodiments of this invention, and that those having ordinary skill in the art will be able to derive other drawings based on the arrangements shown in these drawings without making inventive efforts, where in these drawings:

FIG. 1 is a schematic diagram illustrating the internal structure of a wall-mounted air conditioner indoor unit in accordance with an embodiment of the present invention;

FIG. 2 is a schematic diagram illustrating the assembly of the chassis and the air outlet frame of FIG. 1;

FIG. 3 is a top view of the wall-mounted air conditioner indoor unit of FIG. 2.

FIG. 4 is a cross-sectional view of the wall-mounted air conditioner indoor unit of FIG. 3 taken along line M-M.

FIG. 5 is a schematic diagram illustrating the assembly of air outlet frame and the cross flow fan of FIG. 2.

FIG. 6 is a schematic diagram of the chassis of FIG. 2 taken from a perspective.

FIG. 7 is a schematic diagram of the chassis of FIG. 2 taken from another perspective.

FIG. 8 is an enlarged view of feature C of FIG. 7.

FIG. 9 is a schematic diagram of the wall-mounted air conditioner indoor unit of FIG. 1 taken from another perspective.

Explanation of Reference Numerals:

[0031]

Reference Numerals	Names	Reference Numerals	Names
10	Wall-Mounted Air Conditioner Indoor Unit	11	Chassis
12	Heat Exchanger	13	Air Outlet Frame
14	Grille	15	Cross Flow Fan
16	Electric Fan Motor	11a	Bottom Plate
11b	Baffle Plate	11c	Spring Latch
11d	Pipe Guiding Groove	110a	First Sliding Groove
110b	Second Sliding Groove	111	Inward Flange
13a	Frame Body	13b	First Sliding Block
13c	Second Sliding Block	13d	Water receiving groove
13e	Air deflector mounting support		

[0032] Implementations, functional features, and advantages of this invention will now be described in further detail in connection with some illustrative embodiments and the accompanying drawings.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0033] Technical solutions reflected in various embodiments of this invention will now be described in a clear and comprehensive manner in connection with the accompanying drawings intended for these embodiments. Apparently, the described embodiments are merely some but not all of the embodiments of this invention. All other embodiments derived by persons having ordinary skill in the art based on the embodiments of this invention without making inventive efforts shall all fall within the intended scope of protection sought by this invention.

[0034] As used herein, all directional indicators (such as "upper," "lower," "left," "right," "front," "rear," ...) in the embodiments of this invention are merely used to explain the relative positions and movement or the like between various components under a specific posture (as shown in the drawings), and should the specific posture change, these directional indicators will also change accordingly.

[0035] As used herein, terms such as "first," or "second," are intended for illustrative purposes only and are not to be

construed as indicating or implying their relative importance or implicitly indicating the number of the specified technical features. Thus, a feature defined by terms such as "first," or "second" may explicitly or implicitly include at least one of such a feature. In addition, technical solutions of various embodiments can be combined with one another; such combinations however must be based on the achievability by those having ordinary skill in the art. Where a combination of technical solutions ends up contradictory or unachievable, such a combination shall not be regarded as existent nor would it fall within the scope of protection of the present invention.

[0036] The present invention provides a wall-mounted air conditioner indoor unit as well as a wall-mounted air conditioner having the wall-mounted air conditioner indoor unit.

[0037] Referring to FIG. 1, a wall-mounted air conditioner indoor unit 10 generally has a chassis 11, a surface cover (not shown), a grille 14, a heat exchanger 12, a cross flow fan 15, and an electric fan motor 16 (see FIG. 2). Heat exchanger 12 is mounted on chassis 11 and encloses with chassis 11 to create an air duct cavity having a downward opening. Cross flow fan 15 is installed within the air duct cavity. When wall-mounted air conditioner indoor unit 10 is in operation, the external air enters the interior of wall-mounted air conditioner indoor unit 10 and exchanges heat with heat exchanger 12, before being led out of the opening by cross-flow fan 15.

[0038] In various embodiments of the present invention, as illustrated in FIGS. 3 to 5, wall-mounted air conditioner indoor unit 10 includes a chassis 11, a heat exchanger 12, and an air outlet frame 13. Chassis 11 has an upper and a lower end in a width thereof and is provided with two baffle plates 11b that extend vertically and face each other. Each of baffle plates 11b has an inner surface in which a first sliding groove 110c is defined. First sliding groove 110c in each of baffle plates 11b has a groove bottom facing the other baffle plate 11b, and the groove bottom is partially recessed to define a second sliding groove 110b. Heat exchanger 12 is mounted on chassis 11. Chassis 11, the two baffle plates 11b, and heat exchanger 12 collectively enclose an air duct cavity with a downward opening. Air outlet frame 13 is used for mounting a cross flow fan 15. Two opposite ends of air outlet frame 13 that lie in a length of chassis 11 are each provided with a first sliding block 13b and a second sliding block 13c. Air outlet frame 13 is detachably mounted onto each of the two baffle plates 11b within the air duct cavity by fitting of first sliding groove 110c and first sliding block 13b as well as the fitting of second sliding groove 110b and second sliding block 13c.

[0039] Specifically, as illustrated in FIG. 6, wall-mounted air conditioner indoor unit 10 is formed in a substantially rectangular parallelepiped shape. When it is mounted on a wall, wall-mounted air conditioner indoor unit 10 has left and right ends in a length thereof, upper and lower ends in the width thereof, and front and rear sides in a direction perpendicular to the wall. Chassis 11 has a bottom plate 11a for mounting against a wall. The two baffle plates 11b are a left baffle plate 11b and a right baffle plate 11b that are disposed on the left and the right respectively and are spaced apart from each other. Both baffle plates 11b extend forward from bottom plate 11a. Left baffle plate 11b has an inner plate surface facing right baffle plate 11b. Right baffle plate 11b also has an inner plate surface facing a plate surface of left baffle plate 11b. Both inner plate surfaces are each provided with a first sliding groove 110c and a second sliding groove 110b.

[0040] As illustrated in FIG. 5, air outlet frame 13 may be a frame body 13a used only for mounting cross flow fan 15, or may also be a combination of frame body 13a and at least one selected from the group consisting of a volute tongue, an air deflector mounting support 13e, and a water receiving groove 13d.

[0041] Both ends (i.e., the left and right ends) of air outlet frame 13 are each provided with a first sliding groove 110c adapted to fit with first sliding block 13b, and a second sliding groove 110b adapted to fit with second sliding block 13c.

[0042] As illustrated in FIGS. 5 and 7, after air outlet frame 13 has been slidably installed in place through the relative sliding of first sliding groove 110c and first sliding block 13b as well as the relative sliding of second sliding groove 110b and second sliding block 13c, air outlet frame 13 can be fixed within the air duct cavity via a fastener (such as a screw). When the user needs to remove cross flow fan 15 out for cleaning purposes, he needs only to first remove the fastener and then pull air outlet frame 13 out of the air duct cavity along first sliding groove 110c. After cleaning of cross flow fan 15 has been completed, first sliding block 13b can be aligned with first sliding groove 110c while second sliding block 13c can be aligned with second sliding groove 110b, and then air outlet frame 13 can be pushed from the opening into the air duct cavity.

[0043] Here, as illustrated in FIG. 5, a motor mounting position may further be provided on air outlet frame 13 for mounting an electric fan motor 16. As such, in removing cross flow fan 15, electric fan motor 16 can be detached together, or when electric fan motor 16 needs to be maintained, it is also possible to directly remove air outlet frame 13 and then remove electric fan motor 16.

[0044] In the technical solution of the present invention, a first sliding groove 110c and a second sliding groove 110b are defined in each of the two baffle plates 11b that enclose the air duct cavity, and a first sliding block 13b adapted to fit with the first sliding groove 110c as well as a second sliding block 13c adapted to fit with the second sliding groove 110b are provided on each of both ends of the air outlet frame 13. Thus, to disassemble cross flow fan 15, the user needn't remove heat exchanger 12, but needs only to slide air outlet frame 13 out of the air duct cavity, thereby greatly reducing the difficulty of detaching cross flow fan 15.

[0045] Referring to FIG. 5, in the above embodiment, first sliding block 13b may be circular, square, or may also be other regular or irregular shapes. Second sliding block 13c may be formed by protruding of first sliding block 13b.

Alternatively, First sliding block 13b may have a ring shape, and second sliding block 13c may be formed by protruding of a middle portion closed by first sliding block 13b. Setting two sliding blocks to fit with the two sliding grooves can increase the sliding stability of air outlet frame 13. Here, in order to further improve the sliding stability of air outlet frame 13 and prevent air outlet frame 13 from swinging back and forth to interfere with heat exchanger 12 or chassis 11, second sliding block 13c on each of baffle plates 11b has an end surface facing the other baffle 11b. Second sliding block 13c is located on an end surface of first sliding block 13b and is disposed eccentric in relation to first sliding block 13b. For example, second sliding block 13c can be formed by partially protruding from the edge of the end surface of first sliding block 13b. In this way, by the fitting of second sliding block 13c and second sliding groove 110b, first sliding block 13b can hardly rotate within first sliding groove 110c, so the sliding stability of air outlet frame 13 can be increased.

[0046] Referring now to FIGS. 7 and 8, in order to further enhance the sliding stability of the sliding block in the sliding groove, in this embodiment, a locking groove is defined in an end surface of one end of first sliding block 13b and air outlet frame 13, or a locking groove is defined along a circumference of first sliding block 13b. Side walls that enclose first sliding groove 110a are provided with inward flanges 111 which can extend into the locking groove to be interlocked with first sliding block 13b.

[0047] Considering that when the sliding block slides within the sliding groove, friction can be produced between the groove walls of the sliding groove and the sliding block, on the one hand the resistance would be large when air outlet frame 13 is sliding so that air outlet frame 13 cannot be set into motion smoothly; on the other hand, a relatively large number or a long term of slides can cause the sliding groove or the sliding block to deform, which is also un conducive to sliding. In an exemplary embodiment, one or more rotating balls are provided on at least one wall of first sliding block 13b facing the inner walls of first sliding groove 110c. Additionally or alternatively, one or more rotating balls are provided on at least one wall of second sliding block 13c facing the inner walls of second sliding groove 110b. First sliding groove 110c has a first groove bottom and first sidewalls adjoining the first groove bottom. Rotating balls are provided on the end surface of the sliding block facing the first groove bottom, or provided on the wall surfaces of the sliding block facing the first sidewalls of the sliding block. Embodiments in which the rotating balls are disposed on second sliding block 13c are similar to the embodiments in which the rotating balls are disposed on first sliding block 13b, so the details are not to be described herein again.

[0048] Referring to FIG. 4, chassis 11 is generally molded by an injection molding process. If first sliding groove 110c and second are not linear during injection molding, the demolding may end up difficult. In order to facilitate the manufacturing and molding, first sliding groove 110c and second sliding groove 110b run parallel with each other and are both linearly arranged in this embodiment. In addition, with the linear grooves (first sliding groove 110c and second sliding groove 110b), first sliding block 13b and the second sliding block 13c of air outlet frame 13 would be able to slide more smoothly in first sliding groove 110c and second sliding groove 110b, respectively.

[0049] The opening of the air duct cavity is usually located at the lower end of the air duct cavity and near the front. Therefore, when air outlet frame 13 is pushed into the air duct cavity, the moving path of air outlet frame 13 is obliquely upward. In view of the moving path of air outlet frame 13, first sliding groove 110c and second sliding groove 110 should also be inclined upwardly. The tilt angle α of each of first sliding groove 110c and second sliding groove 110b cannot be too large, for otherwise air outlet frame 13 would interfere with heat exchanger 12 in sliding. Neither can the angle α be too small, since otherwise air outlet frame 13 would interfere with bottom plate 11a of chassis 11. Based on the previous embodiment, first sliding groove 110c and second sliding groove 110b each makes an angle more than or equal to 10° and less than or equal to 30° with respect to the vertical direction. Here, bottom plate 11a of chassis 11 has a surface that faces the wall and is flush with the wall when wall-mounted air conditioner indoor unit 10 is mounted in a wall-mounted manner, where the vertical direction refers to the direction in which the surface extends up and down.

[0050] Referring also to FIG. 4, in order to facilitate the alignment between the sliding block and the sliding groove for mounting purposes, in this embodiment first sliding groove 110c has a first notch that penetrates through the lower end of the corresponding baffle plate 11b, while second sliding groove 110b has a second notch that penetrates through the lower end of this baffle plate 11b. At least one of the first notch and the second notch are flared. Here, first sliding groove 110c and second sliding groove 11b extend (obliquely extend) from top to bottom along baffle plate 11b, and these two sliding grooves extend to a lower edge of this baffle plate 11b. First sliding groove 110c has two first sidewalls extending toward the lower end of baffle plate 11b, the two first sidewalls including a front sidewall in the front and a rear sidewall in the rear. The notch of first sliding groove 110c is configured in a flaring manner. The corresponding front sidewall of the notch of the first sliding groove 110a may be inclined forward; alternatively, the corresponding rear sidewall of the first notch of the first sliding groove 110c may be inclined backward. Of course, the tilt angle β of each of the front sidewall and the rear sidewall is also limited. In one embodiment, the first notch of first sliding groove 110c has a first guide wall connected to one first sidewall. The first guide wall makes an angle β which is more than or equal to 3° and less than or equal to 10° with the corresponding sidewall. Regarding this angle β , the guiding effect would not be obvious if the angle β is too small. Otherwise if the angle β is too large, then the connection between the first guide wall and the first sidewall may cause interference with first sliding block 13b.

[0051] Second sliding groove 110b includes second sidewalls extending towards the lower end of baffle plate 11b as

well as a second guide wall that is located on the second notch and connected to one second sidewall. The second guide wall makes an angle which is more than or equal to 3° and less than or equal to 10° with the corresponding second sidewall. For the specific implementation of second sliding groove 110b, see the relevant description of first sliding groove 110c.

[0052] With reference to FIG. 5, it has been described above that air outlet frame 13 may be a frame body 13a provided for the sole purpose of mounting cross flow fan 15; alternatively, air outlet frame 13 can also be a combination of frame body 13a and at least one selected from the group consisting of the volute tongue, air deflector mounting support 13e, and water receiving groove 13d. In view of the fact that air deflector mounting support 13e and water receiving groove 13d are typically located at the air outlet, so if water receiving groove 13d and air deflector mounting support 13e are not mounted on the above-described frame body 13a, then water receiving groove 13d and air deflector mounting support 13e would need to be removed before removing the above frame body 13a. As such, the steps of detaching cross flow fan 15 would be increased. In addition, the volute tongue also needs to be removed and cleaned on a regular basis.

[0053] In view of this, in this embodiment air outlet frame 13 includes frame body 13a provided for mounting cross flow fan 15, the volute tongue, water receiving groove 13d connected to the volute tongue, and air deflector mounting support 13e connected to the volute tongue. Frame body 13a, the volute tongue, water receiving groove 13d, and air deflector mounting support 13e are integrally formed. As such, to remove air outlet frame 13, only the surface cover needs to be opened, and then the positioning member for fixing air outlet frame 13 can be removed so that air outlet frame 13 can be directly pulled out of the air duct cavity.

[0054] Referring now to FIG. 5 and FIG. 6, after air outlet frame 13 is pushed into the air duct cavity, in order to facilitate the preliminary positioning of air outlet frame 13, in an exemplary embodiment an inner surface of each of baffle plates 11b is provided with a spring latch 11c, while both ends of air outlet frame 13 are each provided with a positioning slot, so that air outlet frame 13 can be limited and thus installed within the air duct cavity by fitting of spring latch 11c and the positioning slot. When air outlet frame 13 is entering the inner cavity, the two ends of air outlet frame 13 would press against spring latch 11c so that spring latch 11c elastically deforms until air outlet frame 13 completely enters the inner cavity. At this point, the positioning slot would align with spring latch 11c in position, and so spring latch 11c would restore its elastic deformation to enter the positioning slot. So under the action of the sliding groove and spring latch 11c, air outlet frame 13 can be preliminarily positioned within the air duct cavity. Then the user can fix air outlet frame 13 within the air duct cavity by means of one or more fasteners.

[0055] Referring now to FIG. 9, bottom plate 11a of chassis 11 may face the wall when wall-mounted air conditioner indoor unit 10 is mounted in a wall-mounted manner. The lower end of bottom plate 11a is usually recessed toward the air duct cavity to define a groove for pipes or wires to pass through. Since the groove is created by bottom plate 11a being recessed toward the air duct cavity, the groove may interfere with air outlet frame 13 when air outlet frame 13 is being pushed into the air duct cavity. In view of this, in this embodiment the upper end of bottom plate 11a is recessed toward the air duct cavity to define a pipe guiding groove 11d extending in the longitudinal direction of chassis 11. Consequently, when air outlet frame 13 is slidably installed, the reserved clearance between bottom plate 11a and air outlet frame 13 would be larger. Therefore, air outlet frame 13 can be installed more smoothly without interference.

[0056] The foregoing merely portrays some illustrative embodiments of the present invention and is therefore not intended to limit the scope of this invention. Without departing from the spirit and scope of this invention, any equivalent configurational changes based on the specification and drawings disclosed herein and any direct or indirect applications of this invention in other technical fields shall all be compassed within the scope of the present invention.

Claims

1. A wall-mounted air conditioner indoor unit, **characterized in that** it comprises:

a chassis, having an upper and a lower end in a width thereof, the chassis being provided with two baffle plates extending vertically and facing each other, each of the two baffle plates having an inner surface provided with a first sliding groove, the first sliding groove having a groove bottom facing the other baffle plate, and the groove bottom being partially recessed to define a second sliding groove;

a heat exchanger, mounted on the chassis, wherein the chassis, the two baffle plates, and the heat exchanger collectively enclose an air duct cavity with a downward opening; and

an air outlet frame, used for mounting a cross flow fan, wherein a first sliding block and a second sliding block are arranged on each of opposite ends of the air outlet frame that lie in a length of the chassis, the air outlet frame being detachably mounted onto each of the two baffle plates within the air duct cavity by the fitting of the first sliding groove and the first sliding block and the fitting of the second sliding groove and the second sliding block.

2. The wall-mounted air conditioner indoor unit according to claim 1, **characterized in that** the first sliding block on each of the two baffle plates has an end surface facing the other baffle plate, and the second sliding block on the baffle plate is formed by partially protruding from the end surface, wherein the second sliding block and the first sliding block are arranged eccentric in relation to each other.
3. The wall-mounted air conditioner indoor unit according to claim 1, **characterized in that** a locking groove is defined in an end surface of one end of the first sliding block and the air outlet frame, or a locking groove is defined along a circumference of the first sliding block; and wherein sidewalls enclosing the first sliding groove are provided with inward flanges, the inward flanges extending into the locking groove to be interlocked with the first sliding block.
4. The wall-mounted air conditioner indoor unit according to claim 1, **characterized in that:** a) one or more rotating balls are provided on at least one wall surface of the first sliding block facing inner walls of the first sliding groove; and/or b) one or more rotating balls are provided on at least one wall surface of the second sliding block facing inner walls of the second sliding groove.
5. The wall-mounted air conditioner indoor unit according to claim 1, **characterized in that** the first sliding groove and the second sliding groove run parallel with each other, and both the first and second sliding grooves are linearly arranged.
6. The wall-mounted air conditioner indoor unit according to claim 5, **characterized in that** the first sliding groove and the second sliding groove each makes with the vertical direction an angle more than or equal to 10° and less than or equal to 30°.
7. The wall-mounted air conditioner indoor unit according to claim 5, **characterized in that** the first sliding groove has a first notch that penetrates through a lower end of the baffle plate, and the second sliding groove has a second notch that penetrates through the lower end of the baffle plate, wherein the first notch and/or the second notch are flared.
8. The wall-mounted air conditioner indoor unit according to claim 7, **characterized in that** the first sliding groove comprises first sidewalls extending towards the lower end of the baffle plate, and a first guide wall located at the first notch and connected to one of the first sidewalls, wherein the first guide wall makes with the first sidewall an angle more than or equal to 3° and less than or equal to 10°; and/or the second sliding groove comprises second sidewalls extending towards the lower end of the baffle plate, and a second guide wall located at the second notch and connected to one of the second sidewalls, wherein the second guide wall makes with the second sidewall an angle more than or equal to 3° and less than or equal to 10°.
9. The wall-mounted air conditioner indoor unit according to claim 1, **characterized in that** the air outlet frame comprises: a frame body configured for mounting the cross flow fan; a volute tongue; a water receiving groove connected to the volute tongue; and an air deflector mounting support connected to the volute tongue, wherein the frame body, the volute tongue, the water receiving groove, and the air deflector mounting support are integrally formed.
10. The wall-mounted air conditioner indoor unit according to claim 1, **characterized in that** each of the two baffle plates has an inner surface provided with a spring latch, and both ends of the air outlet frame are each provided with a positioning slot, wherein the air outlet frame is limited and installed within the air duct cavity through the fitting of the spring latch and the positioning slot.
11. The wall-mounted air conditioner indoor unit according to claim 1, **characterized in that** the wall-mounted air conditioner indoor unit has an electric fan motor connected to the cross flow fan and installed on the air outlet frame.
12. The wall-mounted air conditioner indoor unit according to claim 1, **characterized in that** the chassis comprises a bottom plate having an upper end recessed towards the air duct cavity to define a pipe guiding groove extending in a length of the chassis.
13. A wall-mounted air conditioner **characterized in that** it comprises a wall-mounted air conditioner indoor unit, the wall-mounted air conditioner indoor unit comprising:

a chassis, having an upper and a lower end in a width thereof, the chassis being provided with two baffle plates extending vertically and facing each other, each of the two baffle plates having an inner surface provided a first

sliding groove, the first sliding groove having a groove bottom facing the other baffle plate, and the groove bottom being partially recessed to define a second sliding groove;

a heat exchanger, mounted on the chassis, wherein the chassis, the two baffle plates, and the heat exchanger collectively enclose an air duct cavity with a downward opening; and

an air outlet frame, used for mounting a cross flow fan, wherein a first sliding block and a second sliding block are arranged on each of opposite ends of the air outlet frame that lie in a length of the chassis, the air outlet frame being detachably mounted onto each of the two baffle plates within the air duct cavity by the fitting of the first sliding groove and the first sliding block and the fitting of the second sliding groove and the second sliding block.

14. The wall-mounted air conditioner according to claim 13, **characterized in that** the first sliding block on each of the two baffle plates has an end surface facing the other baffle plate, and the second blocking is formed by partially protruding from the end surface, wherein the second sliding block and the first sliding block are arranged eccentric in relation to each other.

15. The wall-mounted air conditioner according to claim 13, **characterized in that** a locking groove is defined in an end surface of one end of the first sliding block and the air outlet frame, or a locking groove is defined along a circumference of the first sliding block; and wherein sidewalls enclosing the first sliding groove are provided with inward flanges, the inward flanges extending into the locking groove to be interlocked with the first sliding block.

16. The wall-mounted air conditioner according to claim 13, **characterized in that:** a) one or more rotating balls are provided on at least one wall surface of the first sliding block facing inner walls of the first sliding groove; and/or b) one or more rotating balls are provided on at least one wall surface of the second sliding block facing inner walls of the second sliding groove.

17. The wall-mounted air conditioner according to claim 13, **characterized in that** the first sliding groove and the second sliding groove run parallel with each other, and both the first and second sliding grooves are linearly arranged.

18. The wall-mounted air conditioner according to claim 17, **characterized in that** the first sliding groove and the second sliding groove each makes with the vertical direction an angle more than or equal to 10° and less than or equal to 30°.

19. The wall-mounted air conditioner according to claim 17, **characterized in that** the first sliding groove has a first notch that penetrates through a lower end of the baffle plate, and the second sliding groove has a second notch that penetrates through the lower end of the baffle plate, wherein the first notch and/or the second notch are flared.

20. The wall-mounted air conditioner according to claim 19, **characterized in that** the first sliding groove comprises first sidewalls extending towards the lower end of the baffle plate, and a first guide wall located at the first notch and connected to one of the first sidewalls, wherein the first guide wall makes with the first sidewall an angle more than or equal to 3° and less than or equal to 10°; and/or the second sliding groove comprises second sidewalls extending towards the lower end of the baffle plate, and a second guide wall located at the second notch and connected to one of the second sidewalls, wherein the second guide wall makes with the second sidewall an angle more than or equal to 3° and less than or equal to 10°.

21. The wall-mounted air conditioner according to claim 17, **characterized in that** the air outlet frame comprises: a frame body configured for mounting the cross flow fan; a volute tongue; a water receiving groove connected to the volute tongue; and an air deflector mounting support connected to the volute tongue, wherein the frame body, the volute tongue, the water receiving groove, and the air deflector mounting support are integrally formed.

22. The wall-mounted air conditioner according to claim 17, **characterized in that** each of the two baffle plates has an inner surface provided with a spring latch, and both ends of the air outlet frame are each provided with a positioning slot, wherein the air outlet frame is limited and installed within the air duct cavity through the fitting of the spring latch and the positioning slot.

23. The wall-mounted air conditioner according to claim 17, **characterized in that** the wall-mounted air conditioner indoor unit has an electric fan motor connected to the cross flow fan and installed on the air outlet frame.

24. The wall-mounted air conditioner according to claim 17, **characterized in that** the chassis comprises a bottom plate having an upper end recessed towards the air duct cavity to define a pipe guiding groove extending in a length of the chassis.

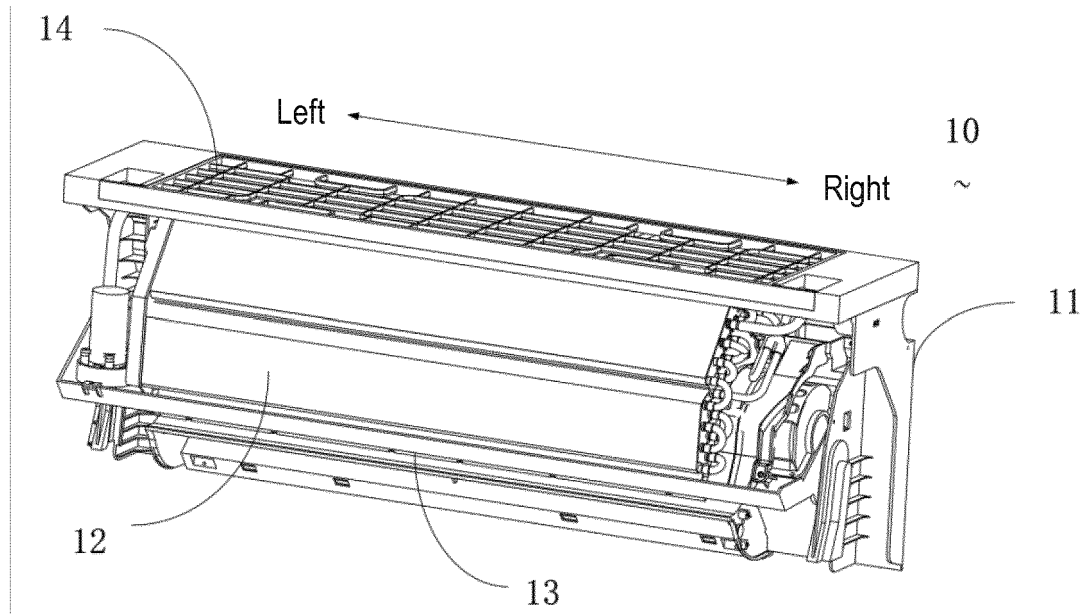


FIG. 1

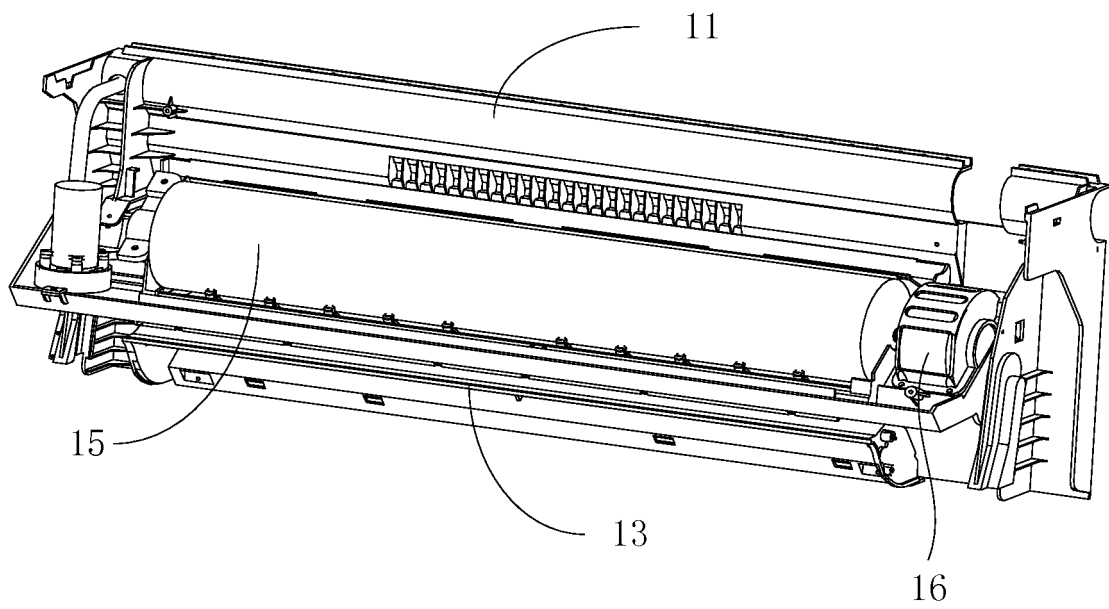


FIG. 2

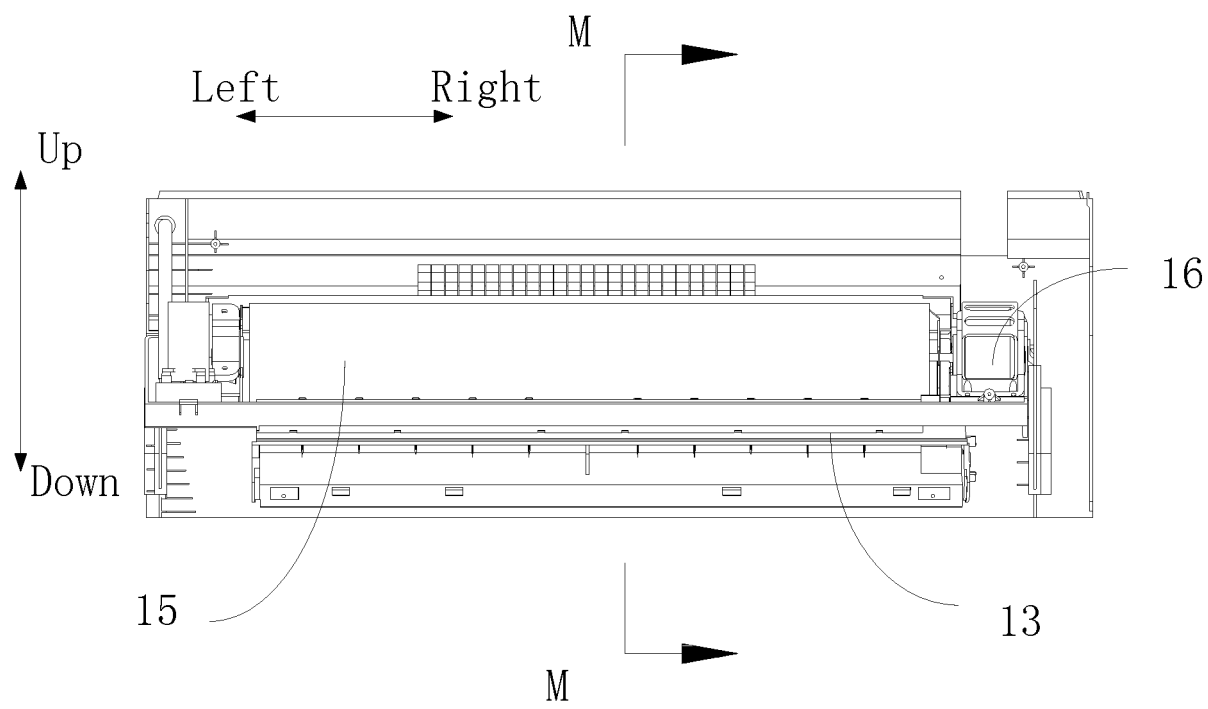


FIG. 3

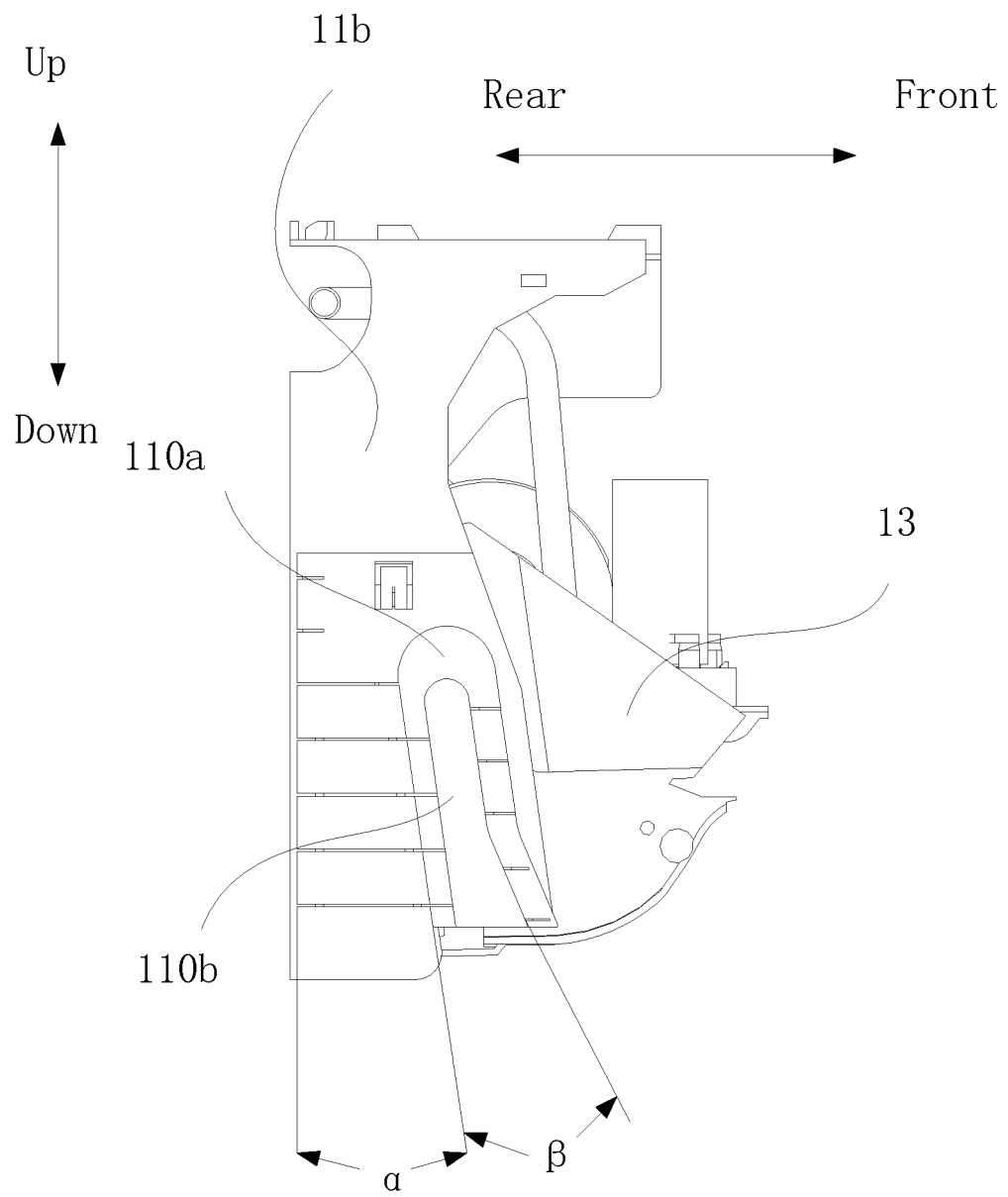


FIG. 4

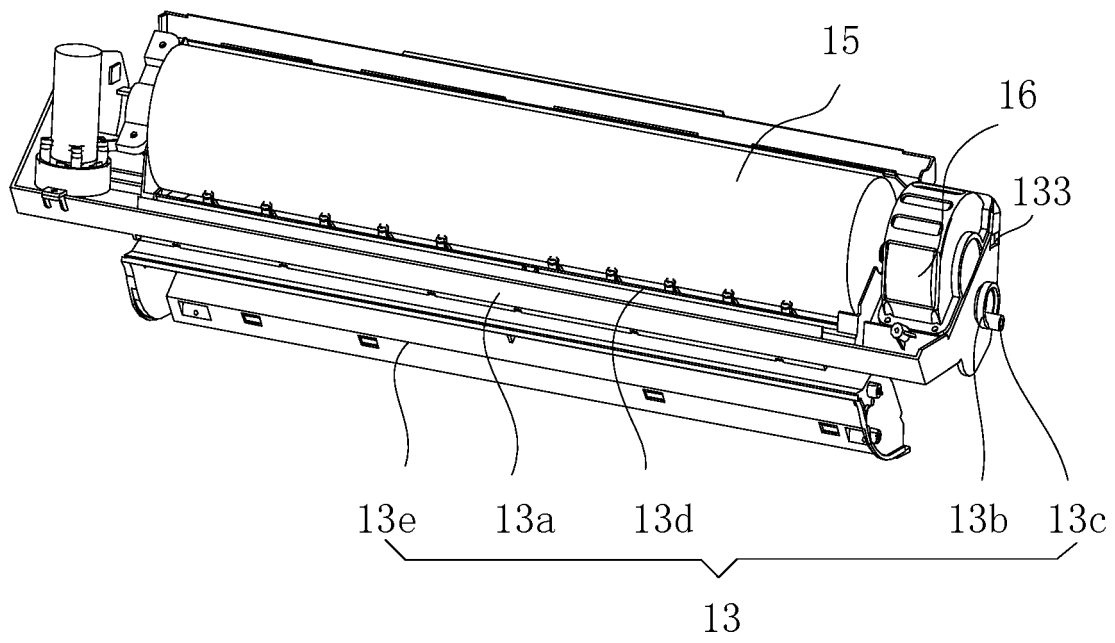


FIG. 5

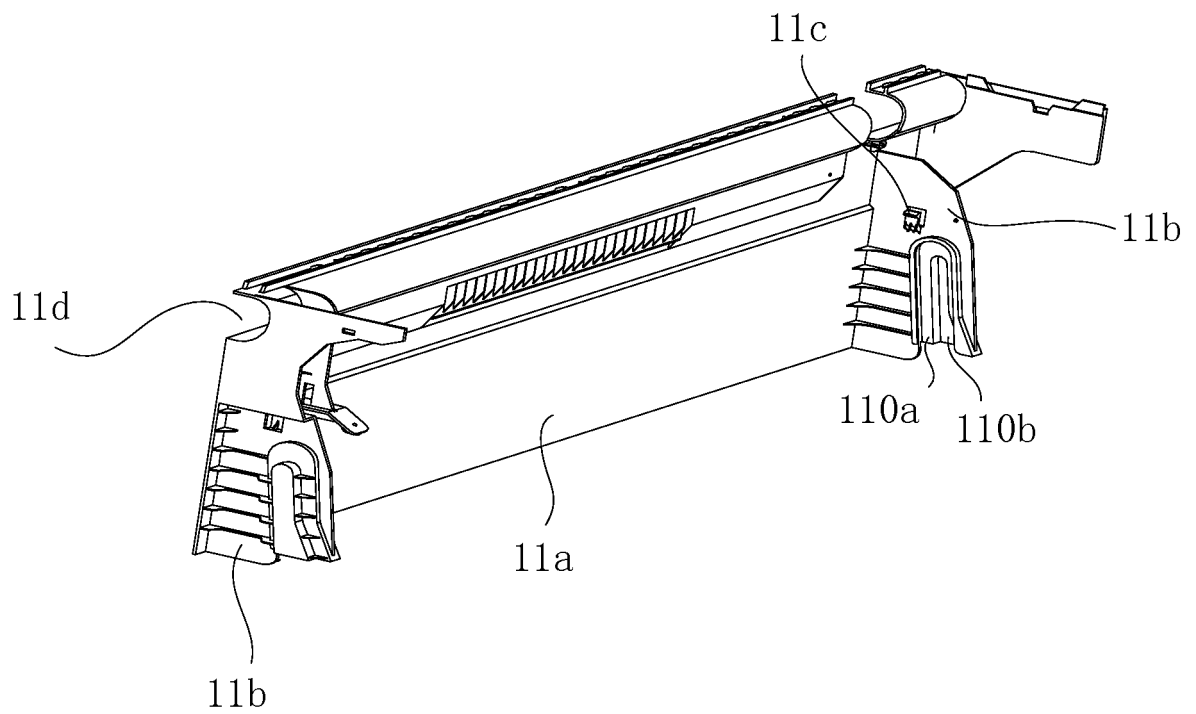


FIG. 6

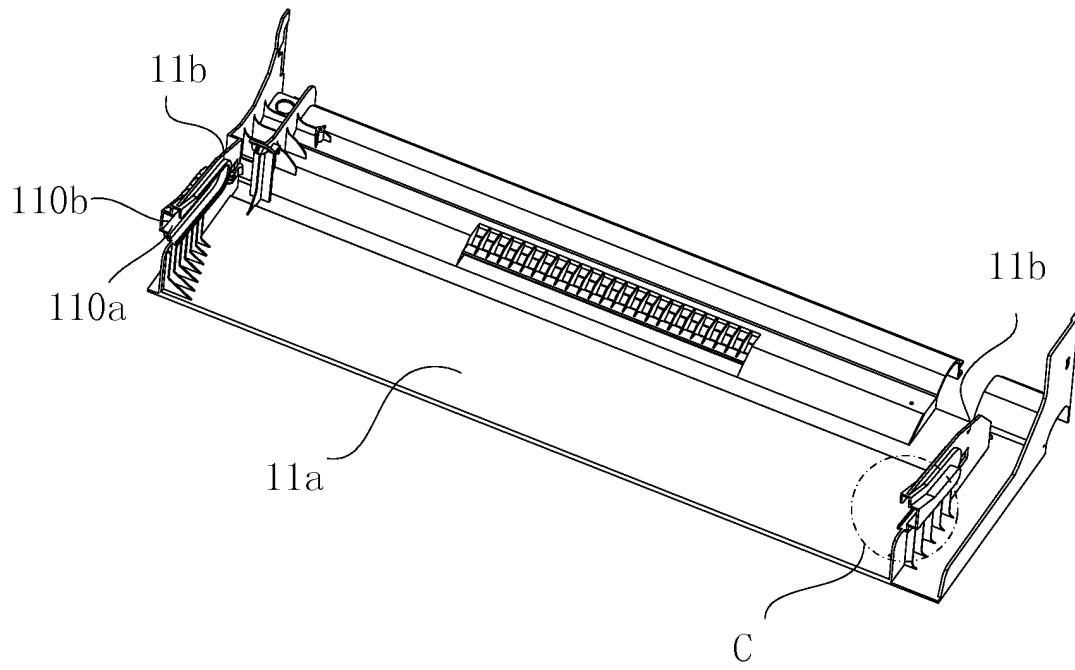


FIG. 7

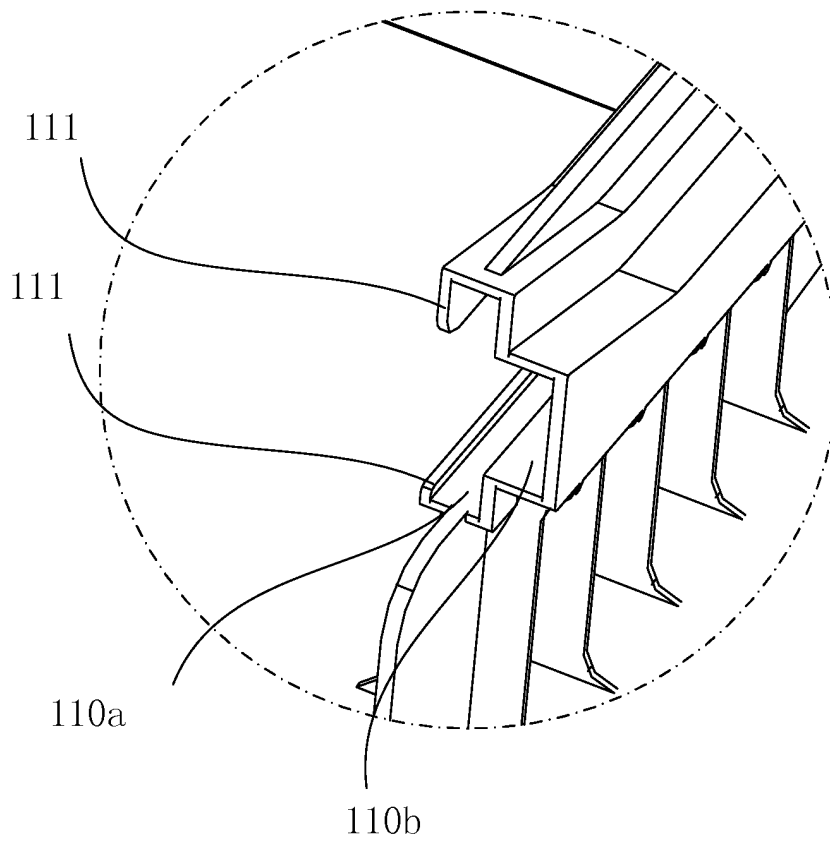


FIG. 8

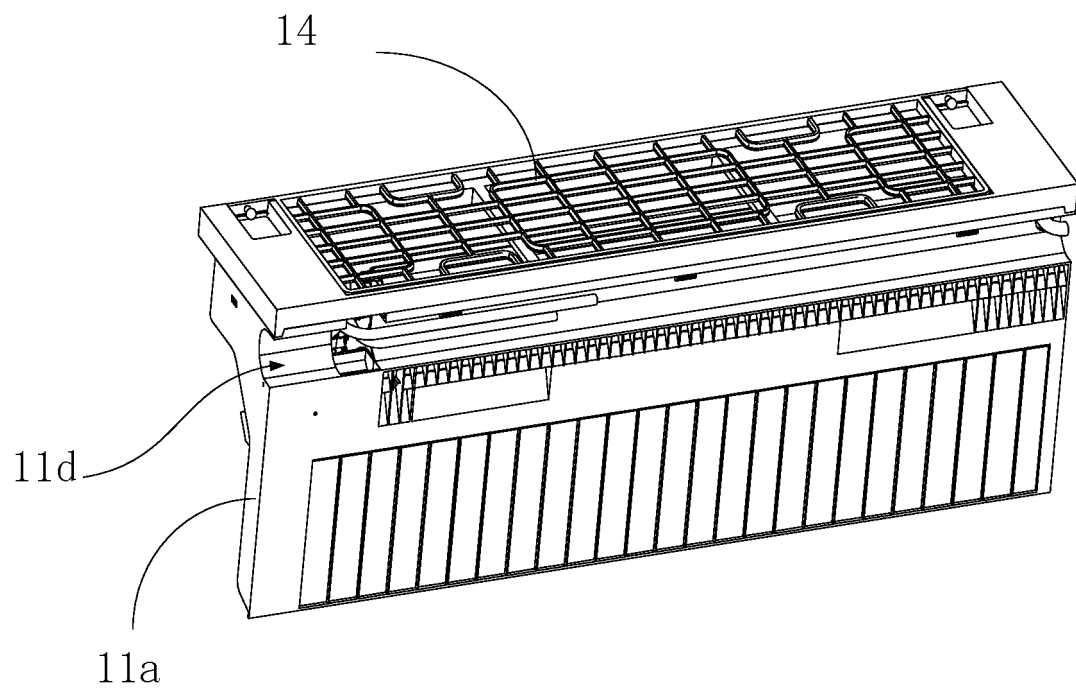


FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2017/082478

A. CLASSIFICATION OF SUBJECT MATTER

F24F 1/00 (2011.01) i; 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)

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, VEN: 空调, 室内机, 挡板, 滑槽, 滑块, 出风框, 贯流风轮, 风道, 换热器, air conditioner, indoor unit, baffle, chute, slider, outlet frame, cross flow fan, duct, heat exchanger

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 204963136 U (GUANGDONG MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.), 13 January 2016 (13.01.2016), description, paragraphs [0031]-[0044], and figures 1-6	1-24
A	CN 204678651 U (GUANGDONG MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.), 30 September 2015 (30.09.2015), entire document	1-24
A	CN 101639280 A (LG ELECTRONICS (TIANJIN) ELECTRICAL APPLIANCES CO., LTD.), 03 February 2010 (03.02.2010), entire document	1-24
A	JP H09229404 A (MITSUBISHI JUKOGYO KK), 05 September 1997 (05.09.1997), entire document	1-24
A	JP H1123000 A (HITACHI LTD.), 26 January 1999 (26.01.1999), entire document	1-24
E	CN 206504403 U (GUANGDONG MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.), 19 September 2017 (19.09.2017), entire document	1-24

☐ Further documents are listed in the continuation of Box C.☒ 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
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"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"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	"&" document member of the same patent family

Date of the actual completion of the international search

12 October 2017

Date of mailing of the international search report

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Authorized officer

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Telephone No. (86-10) 62084782

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2017/082478

5	Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
	CN 204963136 U	13 January 2016	None	
10	CN 204678651 U	30 September 2015	None	
	CN 101639280 A	03 February 2010	None	
	JP H09229404 A	05 September 1997	JP 3367814 B2	20 January 2003
	JP H1123000 A	26 January 1999	None	
15	CN 206504403 U	19 September 2017	None	
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Form PCT/ISA/210 (patent family annex) (July 2009)