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(54) **WALL HANGING AIR CONDITIONER**

(57) A wall hanging air conditioner includes a panel (1) disposed with an air outlet (10), and an air sweep blade mechanism (3). The air sweep blade mechanism

(3) is mounted in the lower part (102) of the air outlet (10). The invention has advantages of buffering wind power, improving discharge angle, and increasing human comfort effectively.

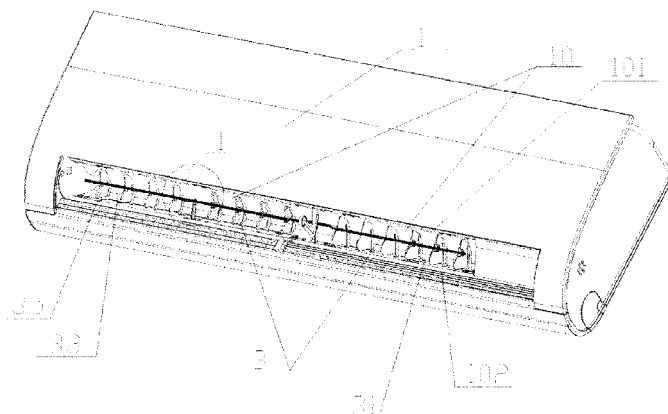


Fig. 1

Description

[0001] The present application claims the benefit of priority to the Chinese patent application No. 201020158149.X titled "WALL HANGING AIR CONDITIONER", filed with the Chinese State Intellectual Property Office on April 9, 2010, the entire disclosures of which is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present application relates to the field of indoor air conditioners, in particular, to a wall mounted air conditioner.

BACKGROUND OF THE INVENTION

[0003] Swing blades of the wall mounted air conditioner in the prior art are generally mounted at an upper portion of the air outlet. Since the air outlet of the air conditioner has a larger air output at the lower portion than at the upper portion, the adjustment of the air discharging angle of the air conditioner and the comfort level would be limited to some extent in the case of mounting the swing blades at the upper portion of the air outlet. Thus, the air blowing out of the air conditioner can not flow properly indoors, and the comfortable feeling of the people in rooms can be reduced.

SUMMARY OF THE INVENTION

[0004] An object of the present application is to provide a wall mounted air conditioner which can solve some technical problems such as the limited air discharging angle of the air conditioner and the low comfort level.

[0005] In view of this, the present application provides a wall mounted air conditioner which includes: a panel provided with an air outlet, and a swing blade mechanism mounted at a lower portion of the air outlet.

[0006] Further, the swing blade mechanism may include: a base mounted on an air outlet seat of the lower portion of the air outlet; a plurality of swing blades provided on the base in sequence; and a transmission mechanism connected transmittedly to a drive output end of a swing motor of the wall mounted air conditioner and connected to each of the plurality of swing blades.

[0007] Further, each of the plurality of the swing blades may include: a blade body connected to the transmission mechanism; a blade seat provided at a bottom portion of the blade body and fixedly connected to the base; and an elastic connecting part connecting between the blade body and the blade seat.

[0008] Further, the elastic connecting part may be of an elongated shape, and an upper end of the elastic connecting part may be connected to an inner edge of the blade body.

[0009] Further, the transmission mechanism may be a connecting rod. The connecting rod may be provided with

a plurality of grooves, and a blade notch may be provided at an outer side of each of the blade bodies. The blade notch of each of the blade bodies may be fitted with the corresponding groove of the connecting rod.

[0010] Further, in the case that the transmission mechanism is a connecting rod, the connecting rod may be provided with a plurality of ring-shaped friction portions, and a blade notch may be provided at one side of each of the blade bodies. The blade notch of each of the blade bodies is closely fitted with the corresponding friction portion of the connecting rod.

[0011] Further, the blade notch may be provided at a middle portion of an outer edge of the corresponding blade body.

[0012] Further, the swing blade mechanism may include a manual adjusting device. The manual adjusting device may include: a rotary shaft rotatably provided on the base and including a manual force exerting portion and a pinion portion; and a rack portion provided on the connecting rod and engaged with the pinion portion.

[0013] Further, the manual force exerting portion is a polyhedral prism portion provided at a middle portion of the rotary shaft, and the pinion portion is provided at an upper end of the rotary shaft.

[0014] Further, the base of the swing blade mechanism may include: a sinking step portion at least provided at a longitudinal edge portion of the base; a recess portion which may be provided therein with a counter bore extending through the base; and protrusions fitted with an edge portion of the sinking step portion and the counter bore of the recess portion may be provided on the air outlet seat of the air conditioner.

[0015] The present application can obtain the following advantageous technical effects.

[0016] Since the air outlet has a larger air output at the lower portion than at the upper portion, the swing blade mechanism is provided at the lower portion of the air outlet, which may efficiently guide the direction of the air, improve the swing angle, and increase the comfortable feeling of the people.

[0017] The base, the transmission mechanism and the plurality of swing blades are combined to form the swing blade mechanism, which not only can ensure the flexible swing of the blade bodies, but also can facilitate detaching and mounting of the mechanism. When the components of the swing blade mechanism are failure or need to be cleaned, these components can be detached quickly and easily, thereby increasing the operating efficiency.

[0018] With the manual adjusting device connected transmittedly to the transmission mechanism, the swing angle of the swing blades can be adjusted manually, thereby further improving the flexibility of the swing blade mechanism.

[0019] The locating counter bores or locating holes provided in the rectangular recesses are fitted with the locating protrusions or locating pins, so that the swing blade mechanism is mounted on the seat of the lower portion of the air outlet, thereby increasing the detaching

and mounting efficiency of the swing blade mechanism.

[0020] In addition to the above object, characters and advantages, the present application also has other objects, characters and advantages. The present application will be explained in detail with reference to the drawings hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The drawings, which constitute a part of the present application, are provided to help further understand the present application. In the present application, exemplary embodiments and illustrations thereof are used to explain the present application and are not interpreted as an improper limitation to the present application. In the drawings:

[0022] Figure 1 is a structural schematic view of the assembly of a preferred embodiment of the present application;

[0023] Figure 2 is a structural schematic view of a swing blade mechanism of a preferred embodiment of the present application;

[0024] Figure 3 is a structural schematic view of one swing blade of a preferred embodiment of the present application; and

[0025] Figure 4 is an enlarged structural schematic view of part I in figure 1 indicating a manual rotary device.

DETAILED DESCRIPTION

[0026] Hereinafter, embodiments of the present application will be explained in detail in conjunction with the accompany drawings. However, the present application may be implemented in different manners as defined and covered by claims.

[0027] As shown in figure 1, the wall mounted air conditioner of the present application includes a panel 1. An air outlet 10 is provided in the panel 1, and a swing blade mechanism 3 is provided at a lower portion 102 of the air outlet.

[0028] In the prior art, the swing device for is generally mounted at the upper portion 101 of the air outlet 10. However, since the air outlet has a larger air output at the lower portion 102 than at the upper portion, it is difficult for the swing device located at the upper portion of the air outlet 10 to perform an effective sweep for the air outgoing from the lower portion 102 of the air outlet, and the air discharging angle of the air conditioner is also limited. In the present application, the swing blade mechanism 3 is provided at the lower portion 102 of the air outlet, which can efficiently change the air discharging direction, and can improve the air discharging angle under a relatively large air force, thereby increasing the flowing range of the air discharged from the air conditioner indoors and increase the comfortable feeling of the people.

[0029] As shown in figures 2 and 3, in order that the swing blade mechanism 3 can achieve a better swing

angle and can be detached or mounted flexibly, preferably, the swing blade mechanism 3 may include a base 31, a transmission mechanism 33, and a plurality of swing blades 35 connected in a transmission manner to the transmission mechanism 33. An end of the transmission mechanism 33 is connected in a transmission manner to a drive output end of a swing motor of the wall mounted air conditioner. The swing blades 35 can be driven to swing left or right under the drive of the swing motor. The plurality of swing blades 35 may be provided on the base 31 in sequence and at an equal interval.

[0030] In order that the swing blades 35 can be detached or mounted more flexibly, each swing blade 35 may include a blade body 351, a blade seat 353, and an elastic connecting part 355 connecting the blade body 351 and the blade seat 353. The blade seat 353 is fixedly connected to an air outlet seat of the lower portion 102 of the air outlet 10.

[0031] In order that the swing blade 35 can be easily deformed to better change the air guide angle, such that the blade body 351 may swing at a larger angle and the swing resistance may be reduced, the elastic connecting part 355 may be of an elongated shape, and an upper end of the elastic connecting part 355 may be connected to an inner edge of the blade body 351.

[0032] Preferably, in the present embodiment, the upper end of the elastic connecting part 355 may be connected to an upper end of the inner edge of the blade body 351, to efficiently reduce the connection portion between the elastic connecting part 355 and the blade body 351 and increase the swing flexibility of the blade body 351.

[0033] The blade body 351 may be fixedly connected to the base 31 via the elastic connecting part 355 and the blade seat 353. The elastic connecting part 355 and the blade body 351 may be made into one piece, or be formed separately. The elastic connecting part 355 and the blade seat 353 may be made into one piece, or be formed separately. The blade seat 353 may be fixedly connected to the base 31 in an inserted coupling manner, and accordingly, the base 31 may be provided with the corresponding number of grooves. Generally, the blade body 351 may be made of an elastic material that can be bent, such that the blade body 351 can be driven by the transmission mechanism 33 to swing left of right under the elastic force.

[0034] In order that the swing blade mechanism 3 can be detached for cleaning or maintaining, each blade body 351 may be connected to the transmission mechanism 33 in a snap-fit coupling manner. The transmission mechanism 33 may be a connecting rod, and each swing blade 35 may be connected to the connecting rod in a snap-fit coupling manner. The connecting rod may be provided with a plurality of grooves, and each blade body 351 may be correspondingly provided at a side thereof with a blade notch 352, such that the blade notch 352 of each blade body 351 is fitted with corresponding groove of the connecting rod.

[0035] The connecting rod may also be provided with a plurality of ring-shaped friction portions, and the blade notch 352 of each blade body 351 may be closely engaged with the corresponding friction portion of the connecting rod, such that the blade body 351 may be driven by the connecting rod to swing left or right under the friction force.

[0036] The blade notch 352 may be provided at a middle portion of an outer edge of each blade body 351 and is located at the opposite side of the elastic connecting part 355.

[0037] When the swing blade mechanism 3 is operated, the connecting rod is rotated under the drive of the drive output end of the swing motor, and thus drives the blade body 351 of each swing blade 35 to swing left or right so as to perform the air sweep, thereby achieving the adjustment of a relatively large air discharging angle.

[0038] As shown in figure 4, in order to further facilitate the adjustment of the swing angle of the swing blades 35, and also to avoid the circumstance in which the direction of the air can not be adjusted due to the breakdown of the swing motor, the swing blade mechanism 3 may further include a manual adjusting device. The manual adjusting device includes a rotary shaft 32 and a rack portion. The rotary shaft 32 is rotatably provided on the base 31, and includes a manual force exerting portion 321 and a pinion portion 322. The rack portion is provided on the connecting rod and engages with the pinion portion 322.

[0039] In order to facilitate applying a force to the manual adjusting device, the manual force exerting portion 321 may be a polyhedral prism portion provided at a middle portion of the rotary shaft 32, and the pinion portion 322 may be provided at an upper end of the rotary shaft 32.

[0040] When it needs to adjust the swing angle of the swing blade 35 manually, the polyhedral prism portion may be rotated manually such that the pinion portion 322 is rotated accordingly, so as to drive the connecting rod to move left or right through the engagement between the pinion of an upper end of the pinion portion and the rack of the connecting rod, thereby achieving the leftward or rightward swing of the swing blade 35.

[0041] The manual force exerting portion 321 may also be configured as a handle mounted on the rotary shaft 32. The rotary shaft 32 may be rotated at an angle by operating the handle, such that the connecting rod moves by a distance in a longitudinal direction, thereby achieving the adjustment of the air direction via the swing blades 35 connected to the connecting rod.

[0042] In order that the swing blade mechanism 3 can be stably mounted on the air outlet seat of the lower portion 102 of the air outlet 10 and can be easily detached, preferably, the swing blade mechanism 3 may further include a sinking step portion 37 which is at least provided at a longitudinal edge portion of the base 31. A lower side of the sinking step portion 37 may be detachably fixed on the air outlet seat of the lower portion of the air outlet

10.

[0043] The sinking step portion 37 may be of a semi-circular shape or a rectangular shape, or any other shape adapted to snap fit with the air outlet seat. Preferably, in the present embodiment, the sinking step portion is of a rectangular shape.

[0044] In order that the swing blade mechanism 3 may be detached, a top surface of the base 31 may be provided with several rectangular recesses 38. In the present embodiment, a rectangular recess 38 may be provided at each end portion as well as a middle position of the base 31. An edge counter bore 382 extending through the base 31 may be provided in each of the rectangular recesses 38 at the two end portions of the base 31, and protrusions fitted with the edge counter bores 382 may be provided at corresponding positions of the air outlet seat of the lower portion 102 of the air outlet 10. Two middle counter bores 381 may be provided in the rectangular recess 38 at the middle position of the base 31. Accordingly, two protrusions corresponding to the two middle counter bores 381 may be provided at corresponding positions of the air outlet seat of the lower portion 102 of the air outlet 10.

[0045] The rectangular recesses 38 may also be of a circular shape or any other suitable shape.

[0046] When the swing blade mechanism 3 is to be mounted in whole to the lower portion 102 of the air outlet 10 of the wall mounted air conditioner according to the present application, the protrusions on the air outlet seat of the lower portion 102 of the air outlet 10 may be inserted into the edge counter bores 382, thereby achieving the reliable mounting of the swing blade mechanism 3. With this kind of mounting structure, when the swing blade mechanism 3 is failure or needs to be cleaned, the swing blade mechanism 3 may be easily detached from the wall mounted air conditioner, which is convenient and flexible.

[0047] The above embodiments are merely preferred embodiments of the present application, and are not intended to limit the invention. Those skilled in the art may also make many alterations and modifications to the present application. Any modifications, equivalents or improvements without departing from the spirit and principle of the present application should be deemed to fall into the protection scope of the present application.

Claims

1. A wall mounted air conditioner comprising a panel (1), an air outlet (10) provided in the panel (1) and a swing blade mechanism (3), **characterized in that**, the swing blade mechanism (3) is mounted at a lower portion (102) of the air outlet (10).
2. The wall mounted air conditioner according to claim 1, wherein the swing blade mechanism (3) comprises:

- a base (31) mounted on an air outlet seat of the lower portion (102) of the air outlet (10);
 a plurality of swing blades (35) provided on the base (31) in sequence; and
 a transmission mechanism (33) transmittedly connected to a drive output end of a swing motor of the wall mounted air conditioner and connected to the plurality of swing blades (35). 5
3. The wall mounted air conditioner according to claim 2, wherein each of the plurality of the swing blades (35) comprises:
- a blade body (351) connected to the transmission mechanism (33);
 a blade seat (353) provided at a bottom portion of the blade body (351) and fixedly connected to the base (31); and
 an elastic connecting part (355) connecting between the blade body (351) and the blade seat (353). 20
4. The wall mounted air conditioner according to claim 3, wherein the elastic connecting part (355) is of an elongated shape, an upper end of the elastic connecting part being connected to an inner edge of the blade body (351). 25
5. The wall mounted air conditioner according to claim 4, wherein,
 the transmission mechanism (33) is a connecting rod provided with a plurality of grooves; and
 a blade notch (352) is provided at an outer side of each of the blade bodies (351), the blade notch (352) of each of the blade bodies (351) being fitted with the corresponding groove of the connecting rod. 30 35
6. The wall mounted air conditioner according to claim 4, wherein,
 the transmission mechanism (33) is a connecting rod provided with a plurality of ring-shaped friction portions; and
 a blade notch (352) is provided at one side of each of the blade bodies (351), the blade notch (352) of each of the blade bodies (351) being closely fitted with the corresponding friction portion of the connecting rod. 40 45
7. The wall mounted air conditioner according to claim 5 or 6, wherein the blade notch (352) is provided at a middle portion of an outer edge of the corresponding blade body (351). 50
8. The wall mounted air conditioner according to any one of claims 1 to 6, wherein the swing blade mechanism (3) further comprises a manual adjusting device, and the manual adjusting device comprises:
- a rotary shaft (32) rotatably provided on the base (31) and comprising a manual force exerting portion (321) and a pinion portion (322); and
 a rack portion provided on the connecting rod and engaged with the pinion portion.
9. The wall mounted air conditioner according to claim 8, wherein the manual force exerting portion is a polyhedral prism portion provided at a middle portion of the rotary shaft (32), and the pinion portion is provided at an upper end of the rotary shaft (32).
10. The wall mounted air conditioner according to claim 9, wherein the base (31) of the swing blade mechanism (3) further comprises:
- a sinking step portion (37) at least provided at a longitudinal edge portion of the base (31);
 a recess portion (38) provided therein with a counter bore (381) extending through the base (31); and
 protrusions provided on the air outlet seat of the air conditioner and fitted with an edge portion of the sinking step portion (37) and the counter bore (381) of the recess portion (38).

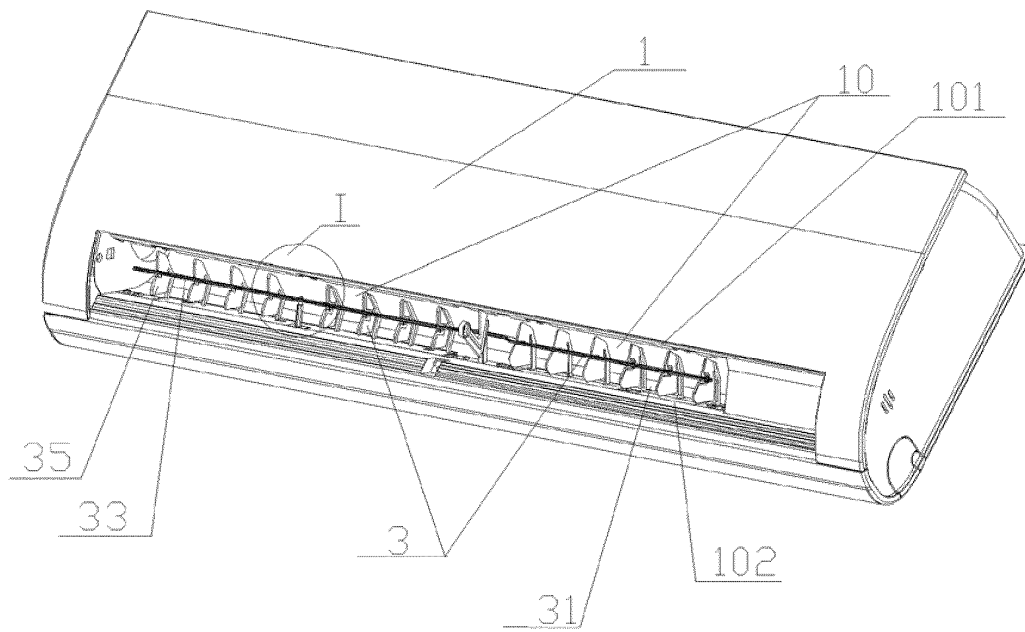


Fig. 1

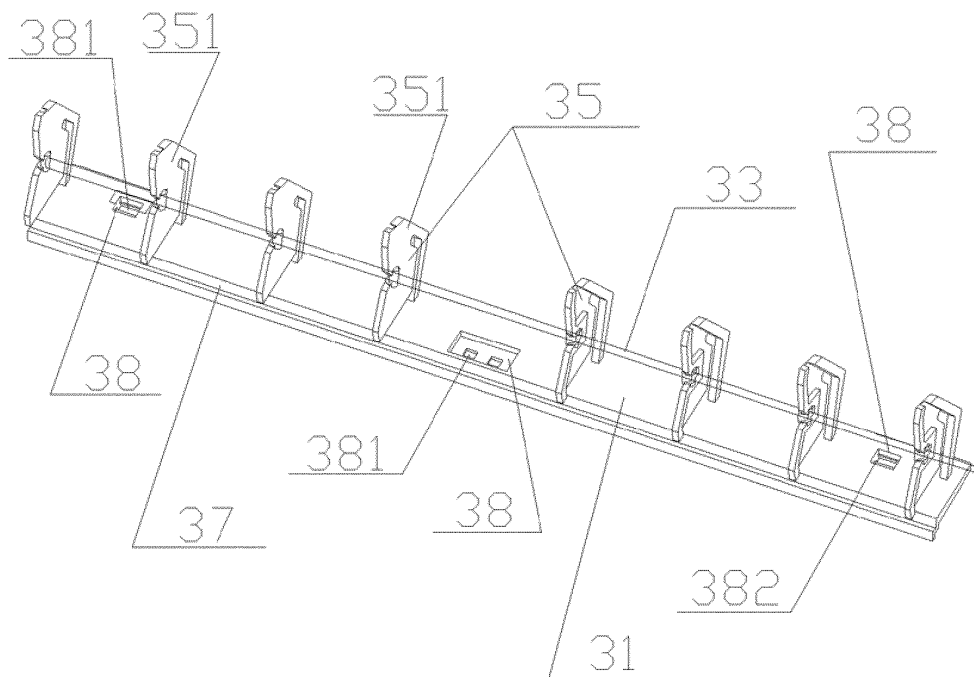


Fig. 2

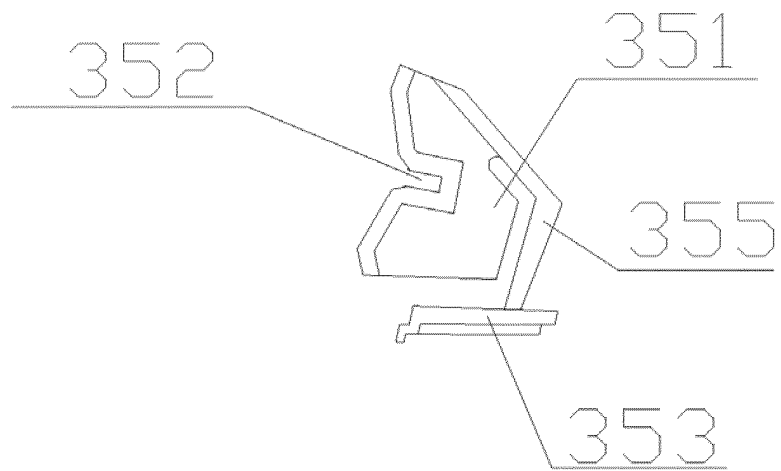


Fig. 3

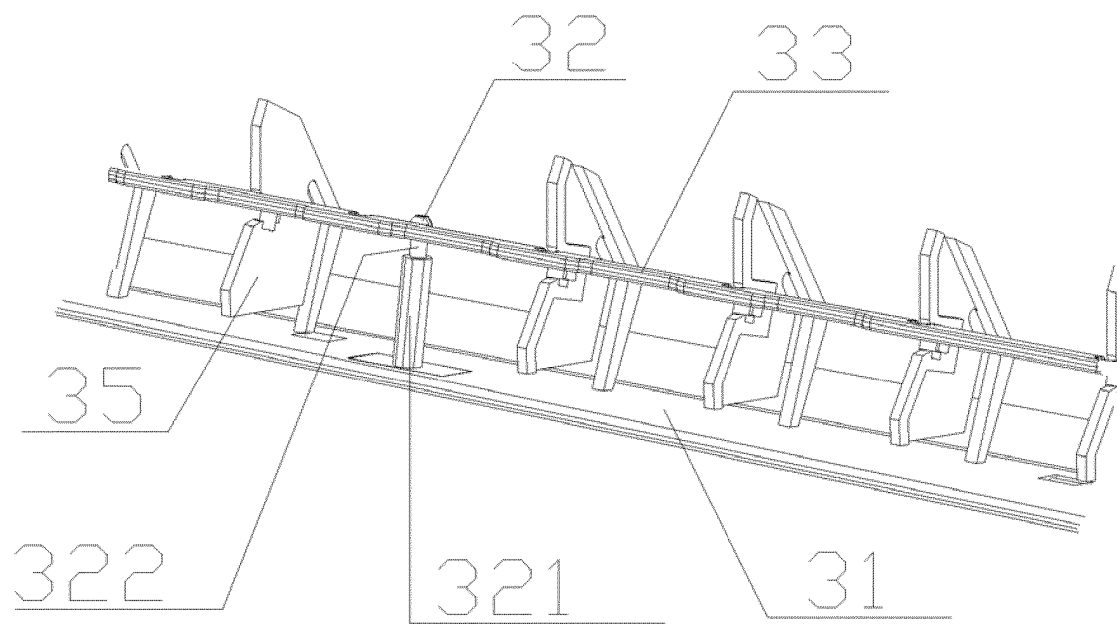


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2011/072492

A. CLASSIFICATION OF SUBJECT MATTER

F24F13/15 (2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: F24F13/08, F24F13/10, F24F13/14, F24F13/15

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)

WPI, EPODOC, CNPAT, CNKI

air condition+, right, left, vertical+, vane, plate, louver, grill, elastic+, flexibility, flexible, manual??, adjust+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	JP 2008025881 A (MITSUBISHI ELECTRIC CORP) 07 Feb. 2008(07.02.2008) Desc. page 3 paragraphs 0008-0009, Figs. 1,2(a),3	1-2
A	whole document	3-10
X	CN 1542368 A (SANYO ELECTRIC CO LTD et al.) 03 Nov. 2004(03.11.2004) Desc. page 4	1

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

* Special categories of cited documents:	"I" 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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"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
10 May 2011(10.05.2011)Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2011/072492

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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