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(54) INDOOR UNIT OF AIR CONDITIONER

(57) An indoor unit of an air conditioner includes a panel body (2) surrounding the side part and the top part of the air conditioner, a back shell (1) surrounding the back part of the air conditioner, and a front panel (3) arranged at the front side and jointed closely with the panel body (2). The back shell (1), the panel body (2) and the front panel (3) define an inner chamber of the air conditioner, in which a heat exchanger, a control element and a ventilation assembly are arranged. An air outlet (4) is disposed at the lower part of the front panel (3), and an air guide plate (5) used to open and close the air outlet (4) is installed on the front panel (3) or the panel body (2). An air shield rib (8) protruding to the air outlet (4) is disposed at the top of the air outlet (4).

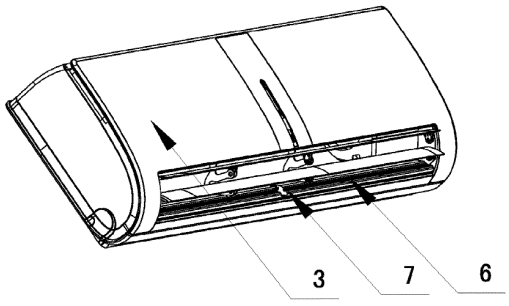

Fig. 2

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Description

FIELD OF THE INVENTION

[0001] The present application relates to a structure of an indoor unit of an air conditioner, in particular, to an indoor unit of an air conditioner having optimized performances and excellent effects.

BACKGROUND OF THE INVENTION

[0002] Generally, the air conditioner is a device that can cool or warm a room, or purify air in the room via an air cooler, a heater or an air cleaner, such that the indoor environment is more comfortable. Such an air conditioner is provided with a ventilation device, an air cooling and heating device, and an air cleaner. The ventilation device can forcedly circulate the air indoors, and specifically absorb the indoor air, perform heat exchange, or purify the air, and then can discharge the air into the room. In the prior art, people have make improvements frequently to the air conditioner. Generally, an indoor unit of an air conditioner includes: a rear housing encasing the side and rear portions of the air conditioner, and a panel body located in front of the rear housing and closely connected to the rear housing. The rear housing and the panel body define the inner cavity of the air conditioner. A heat exchanger, a control element and a ventilation component are provided in the inner cavity. The panel body is typically fixed on the rear housing with screws or in a snap-fit coupling manner. As the air conditioner market is increasingly mature, the requirement of energy-saving performance of the air conditioner becomes increasingly higher. There is thus a need to make various improvements to the air conditioner, and to research and develop an air conditioner having a higher energy efficiency ratio to meet the energy-saving requirement of the air conditioner.

SUMMARY OF THE INVENTION

[0003] An object of the present application is to provide an indoor unit of an air conditioner having a simple structure and improving the performance of the air conditioner, so as to increase the production efficiency and ensure the reliability of the product.

[0004] In order to achieve the above object, the present application provides the following technical solution.

[0005] An indoor unit of an air conditioner includes: a panel body encasing side portions and a top portion of the air conditioner and configured to mount a front panel; a rear housing encasing a rear portion of the air conditioner; and the front panel located in front of the panel body and closely connected to the panel body. The rear housing, the panel body and the front panel define an inner cavity of the air conditioner. An air outlet is provided at a lower portion of the front panel. An air deflector is provided on the front panel or the panel body, and is configured to open and close the air outlet. An air baffle rib is provided at a top portion of the air outlet and extends from the top portion of the air outlet towards the air outlet.

[0006] In summary, the present application has the following advantageous effects.

[0007] In the indoor unit of the air conditioner according to the present application, the air baffle rib is provided at the top portion of the air outlet, and extends from the top portion of the air outlet towards the air outlet, which can ensure a relatively uniform temperature at the air outlet and avoid a partial excessive temperature difference to generate condensate water, thereby reducing the occurrence of condensation and efficiently preventing the resulting condensate water from dropping.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Figure 1 is a perspective structural schematic view of an indoor unit of an air conditioner according to the present application;

[0009] Figure 2 is a structural schematic view showing a position of an eddy formation device of an indoor unit of an air conditioner according to the present application;

[0010] Figure 3 is a structural schematic view of an air outlet of an indoor unit of an air conditioner according to the present application;

[0011] Figure 4 is a front structural schematic view of a panel body of an indoor unit of an air conditioner according to the present application;

[0012] Figure 5 is a perspective structural schematic view of a panel body of an indoor unit of an air conditioner according to the present application;

[0013] Figure 6 is a sectional structural schematic view taken along line A-A of figure 4;

[0014] Figure 7 is a structural schematic view showing a position of an air baffle rib of an indoor unit of an air conditioner according to the present application;

[0015] Figure 8 is a structural schematic view of a first embodiment of an air baffle rib of an indoor unit of an air conditioner according to the present application;

[0016] Figure 9 is a structural schematic view of a second embodiment of an air baffle rib of an indoor unit of an air conditioner according to the present application; and

[0017] Figure 10 is a structural schematic view of a third embodiment of an air baffle rib of an indoor unit of an air conditioner according to the present application.

[0018] Reference numerals in the figures:

1. rear housing	2. panel body	3. front panel
4. air outlet	5. air deflector	6. eddy formation device
7. concave groove	8. air baffle rib	9. water film region

DETAILED DESCRIPTION

[0019] The present application provides an indoor unit of an air conditioner. As is shown in figures 1 to 6, the indoor unit of the air conditioner includes: a panel body 2 encasing side portions and a top portion of the air conditioner and configured to mount a front panel; a rear housing 1 encasing a rear portion of the air conditioner; and the front panel 3 located in front of the panel body and closely connected to the panel body. The rear housing 1, the panel body 2 and the front panel 3 define an inner cavity of the air conditioner, and a heat exchanger, a control element and a ventilation component are provided in the inner cavity. An air outlet 4 is provided at a lower portion of the front panel 3. An air deflector 5 is mounted on the front panel 3 or is provided on the panel body 2, and is configured to open and close the air outlet 4.

[0020] An eddy formation device 6 is provided at a bottom portion of the air outlet 4, and is fixed on the front panel 3 or the panel body 2 in a horizontal direction and is of an elongated strip-like structure. The eddy formation device 6 includes at least one concave groove 7 extending in a horizontal direction. A concave direction of the concave groove 7 intersects an air outlet direction of the air conditioner at an angle.

[0021] Preferably, the eddy formation device 6 is formed by closely attaching an elongated strip-like member to a bottom surface of the air outlet 4 in the horizontal direction.

[0022] Preferably, the eddy formation device 6 is formed by closely attaching two or more elongated strip-like members to the bottom surface of the air outlet 4 in the horizontal direction in sequence.

[0023] The eddy formation device 6 has a horizontal width dimension smaller than or equal to a width dimension of the air outlet 4.

[0024] As shown in figure 7, an air baffle rib 8 is provided at the top portion of the air outlet 4.

[0025] The air baffle rib 8 extends from the top portion of the air outlet 4 towards the air outlet 4.

[0026] The air baffle rib 8 is an elongated rib-like member attached closely to the top portion of the air outlet 4 in the horizontal direction, and has a horizontal width dimension smaller than or equal to the width dimension of the air outlet 4.

[0027] When an air flow passes through the air baffle rib 8 after passing through the heat exchanger, a pressure of the air flow is changed under the action of the air baffle rib 8, a moving direction of the air flow is impeded to be changed, which can ensure a relatively uniform temperature at the air outlet and avoid a partial excessive temperature difference to generate condensate water, thereby reducing the occurrence of condensation.

[0028] As shown in figure 8, the panel body 2 is provided with a notch for mounting the front panel 3 and a rabbet for fixing the rear housing 1. The panel body 2 extends towards the top of the air outlet 4 to form the air baffle rib 8. A water film region 9 is formed between a bottom portion of the front panel 3 and the air baffle rib 8.

[0029] As shown in figure 9, the rear housing 1 extends towards the top of the air outlet 4 to form the air baffle rib 8, and the rear housing 1 encases the panel body 2 such that the panel body 2 is located behind the air outlet 4.

[0030] As shown in figure 10, the air baffle rib 8 is adhered to the front panel 3; or the front panel 3 extends towards the top of the air outlet 4 to form the air baffle rib 8.

[0031] The above embodiments are not used to limit the invention. Various improvements and modifications made by those skilled in the art without departing from the scope of the present application should be deemed to fall into the protection scope of the present application.

Claims

1. An indoor unit of an air conditioner comprising: a panel body (2) encasing side portions and a top portion of the air conditioner and configured to mount a front panel; a rear housing (1) encasing a rear portion of the air conditioner; and the front panel (3) located in front of the panel body and closely connected to the panel body, wherein the rear

housing (1), the panel body (2) and the front panel (3) define an inner cavity of the air conditioner; an air outlet (4) is provided at a lower portion of the front panel (3); and an air deflector (5) is provided on the front panel (3) or the panel body (2), and is configured to open and close the air outlet (4),
characterized in that,
an air baffle rib (8) is provided at a top portion of the air outlet (4), and extends from the top portion of the air outlet (4) towards the air outlet (4).

2. The indoor unit of the air conditioner according to claim 1, wherein the air baffle rib (8) is configured as an elongated rib-like member attached closely to the top portion of the air outlet (4) in a horizontal direction, and has a horizontal width dimension smaller than or equal to a width dimension of the air outlet (4).

3. The indoor unit of the air conditioner according to claim 2, wherein the panel body (2) is provided with a notch for mounting the front panel (3) and a rabbet for fixing the rear housing (1), the air baffle rib (8) is formed by extending the panel body (2) towards the top of the air outlet (4), and a water film region (9) is formed between a bottom portion of the front panel (3) and the air baffle rib (8).

4. The indoor unit of the air conditioner according to claim 2, wherein the air baffle rib (8) is formed by extending the rear housing (1) towards the top of the air outlet (4); and the rear housing (1) encases the panel body (2) such that the panel body (2) is located behind the air outlet (4).

5. The indoor unit of the air conditioner according to claim 2, wherein the air baffle rib (8) is attached to the front panel (3); or is formed by extending the front panel (3) towards the top of the air outlet (4).

6. The indoor unit of the air conditioner according to claim 1, wherein an eddy formation device (6) is provided at a bottom portion of the air outlet (4).

7. The indoor unit of the air conditioner according to claim 6, wherein the eddy formation device (6) is provided on the front panel (3) or the panel body (2) in a horizontal direction and is of an elongated strip-like structure; and the eddy formation device (6) comprises at least one concave groove (7) extending in a horizontal direction, a concave direction of the concave groove (7) intersecting an air outlet direction of the air conditioner at an angle.

8. The indoor unit of the air conditioner according to claim 6, wherein the eddy formation device (6) is formed by closely attaching an elongated strip-like member to a bottom surface of the air outlet (4) in a horizontal direction.

9. The indoor unit of the air conditioner according to claim 6, wherein the eddy formation device (6) is formed by closely attaching two or more elongated strip-like members to a bottom surface of the air outlet (4) in a horizontal direction in sequence.

10. The indoor unit of the air conditioner according to claim 8 or 9, wherein the eddy formation device (6) has a horizontal width dimension smaller than or equal to a width dimension of the air outlet (4).

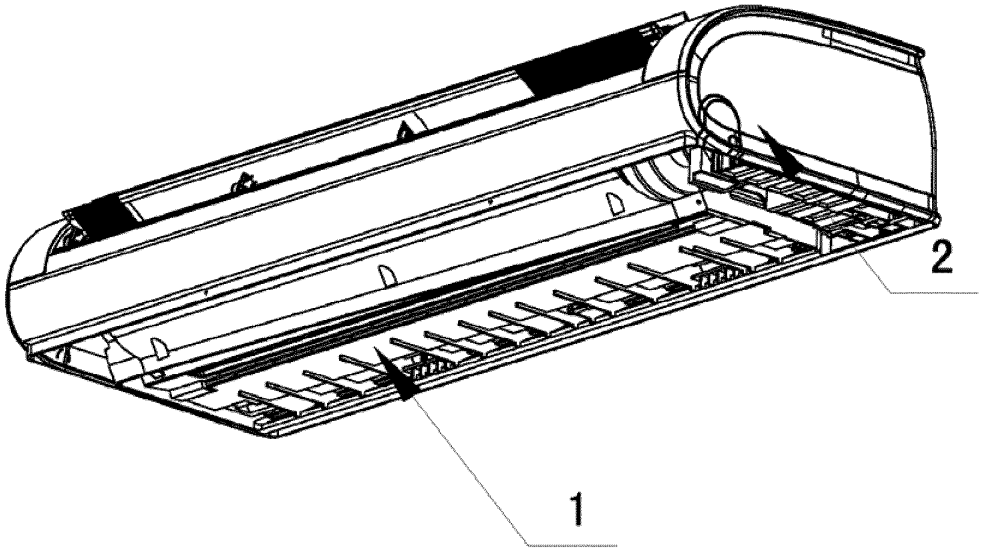

Fig. 1

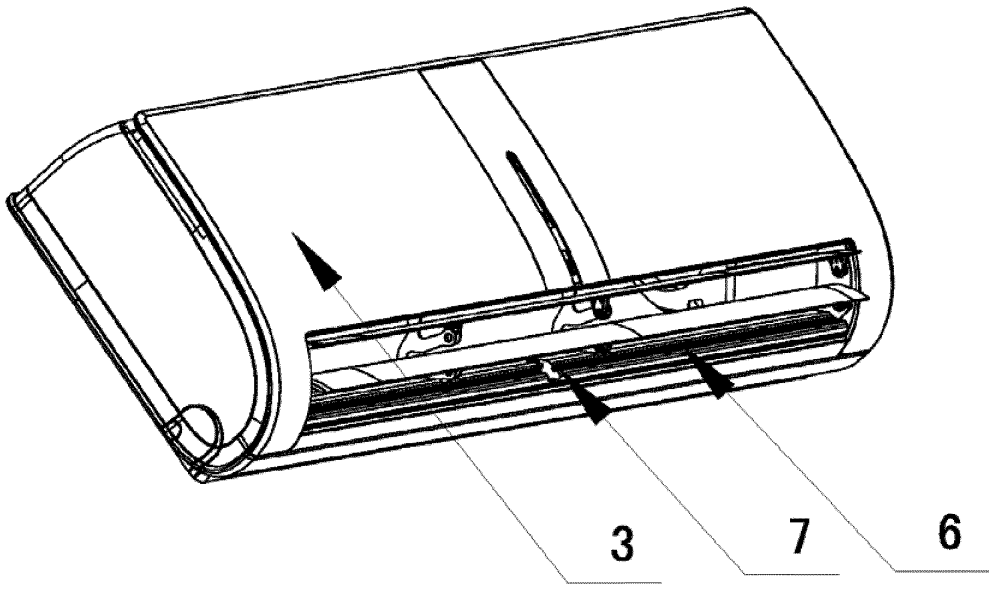

Fig. 2

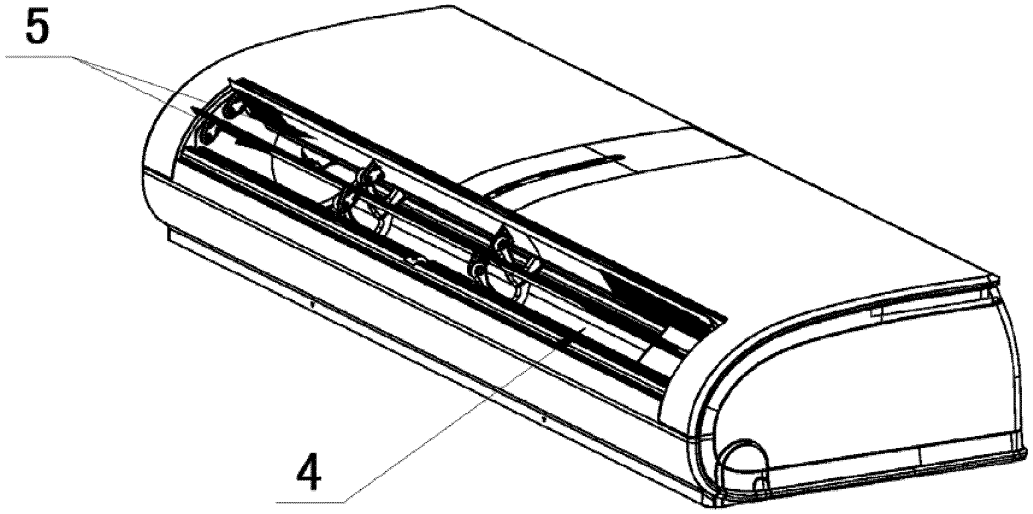

Fig. 3

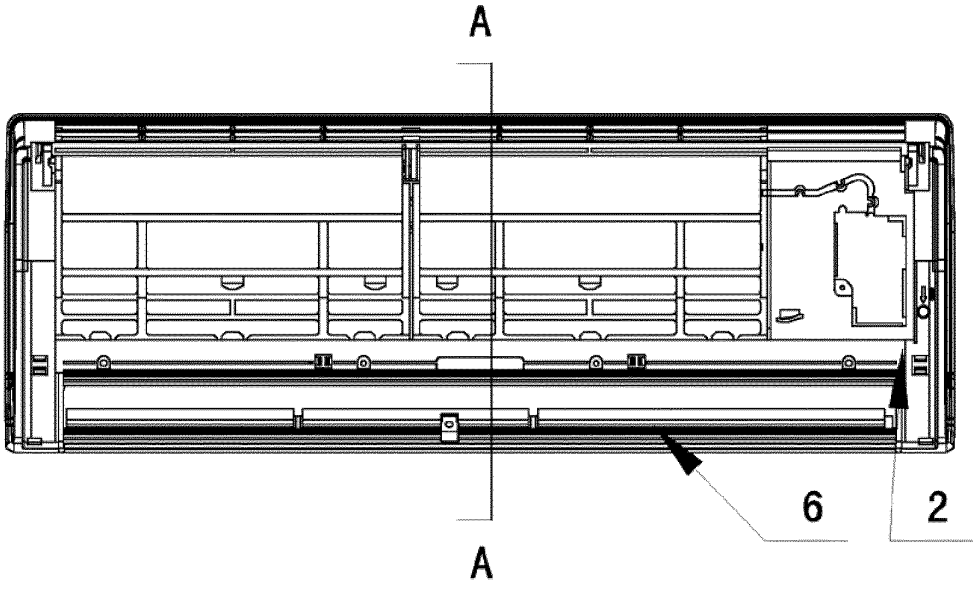

Fig. 4

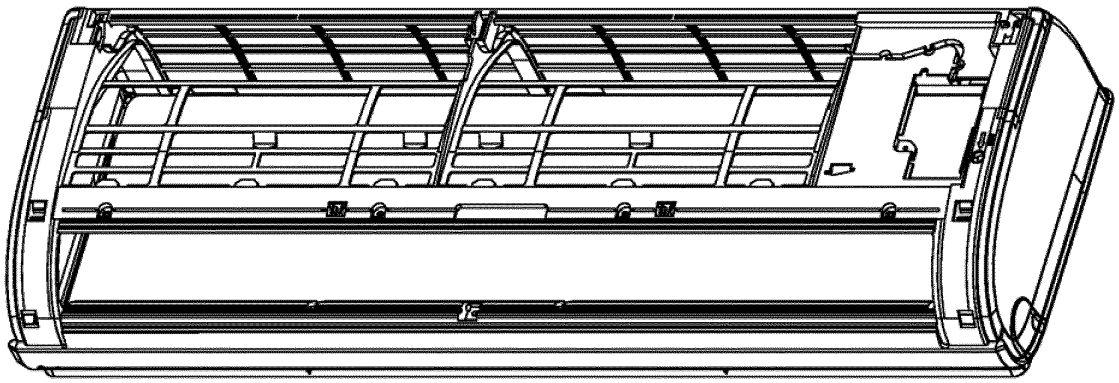

Fig. 5

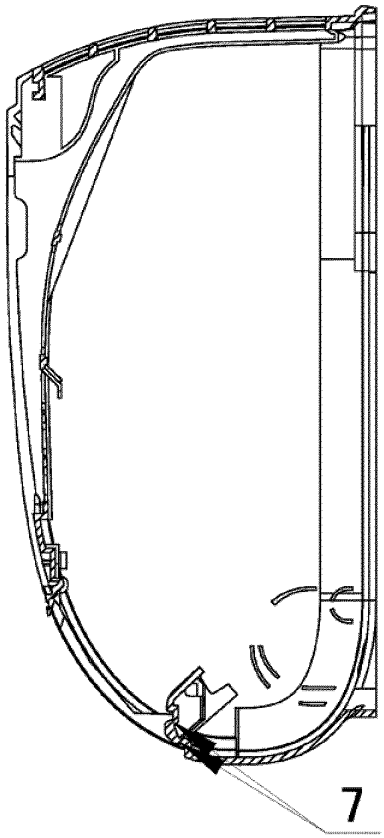

Fig. 6

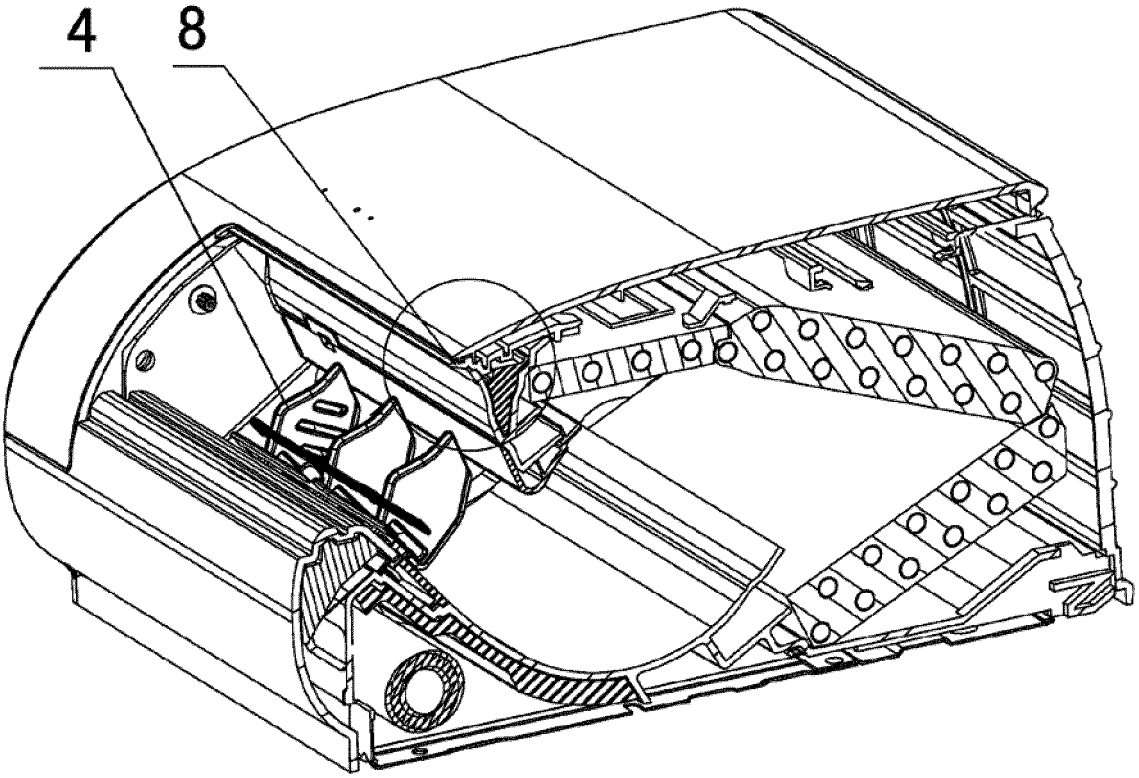

Fig. 7

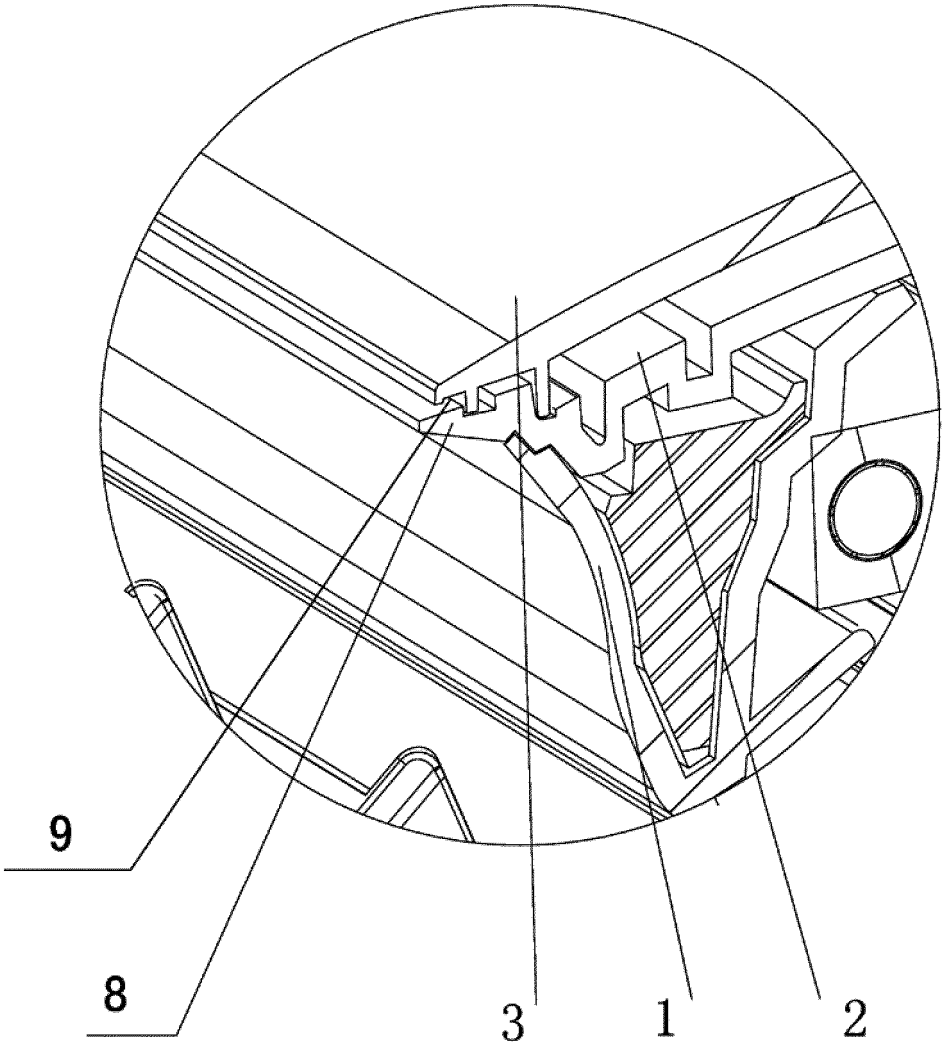

Fig. 8

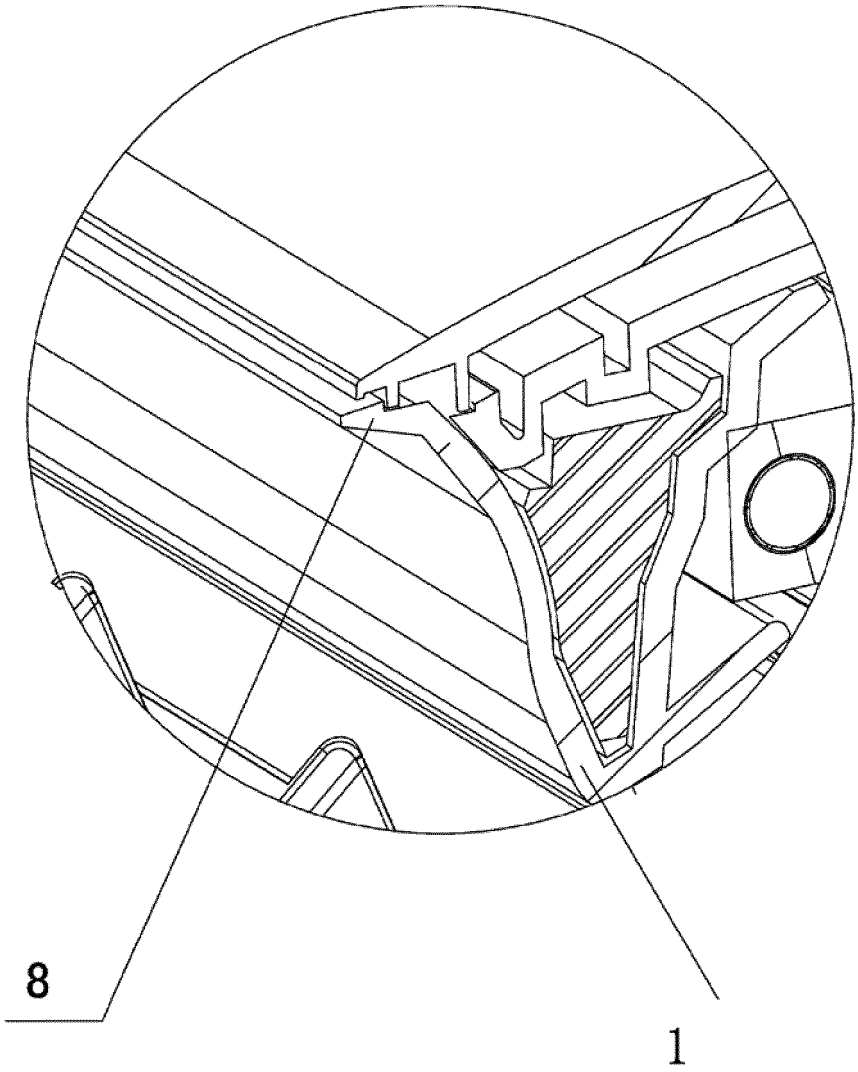

Fig. 9

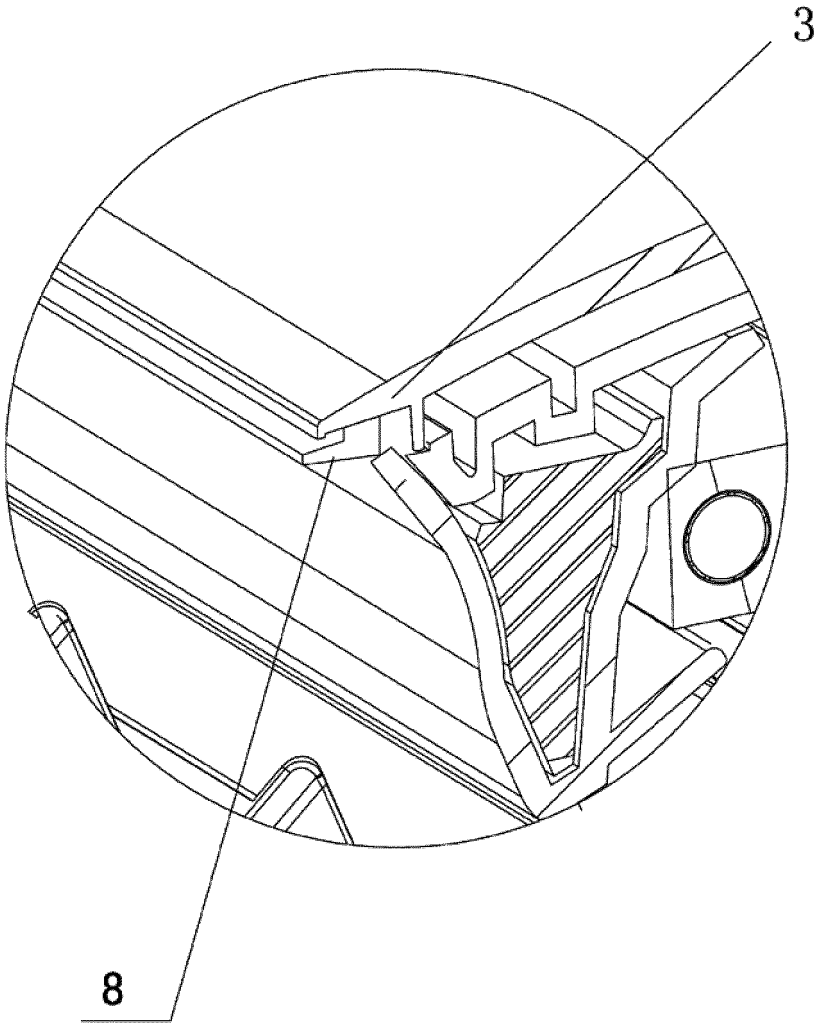

Fig. 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2011/072380

A. CLASSIFICATION OF SUBJECT MATTER

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: F24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI; EPODOC; CNPAT; CNKI

air w condition+, outlet?, discharg+, exhaust+, plat+, baffle+, flap+, damper+, bumper+, buffer+, shield+, guard+, curtain+, rib+, fin+, gill+, condensate, condensed, dew, eddy, vortex, turbulen+, stir+, direction

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 1675504 A (SHARP KK) 28 Sept. 2005(28.09.2005)	1
Y	Desc. page 7 lines 21-31, page 9 lines 6-19, page 12 lines 13-26, Figs. 1-2	2,5-10
A	Whole document	3-4
Y	CN 1158968 A (MITSUBISHI DENKI KK) 10 Sept. 1997(10.09.1997)	2,5
	Desc. page 5 lines 13-14, page 6 lines 9-13, page 11 lines 28-29, Figs. 3-4	
A	Whole document	3-4,6-10

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

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"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

"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

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"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 May 2011(26.05.2011)	**30 Jun. 2011 (30.06.2011)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer HUO, Fang Telephone No. (86-10)62084833

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2011/072380

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 6147527 A (DAIKIN IND LTD) 27 May 1994(27.05.1994) Desc. paragraphs 0011-0022, Figs. 1-2	6-10
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A	JP 2002250534 A (MITSUBISHI JUKOGYO KK) 06 Sept. 2002(06.09.2002) Whole document	1,6-10

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2011/072380

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INTERNATIONAL SEARCH REPORT

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CLASSIFICATION OF SUBJECT MATTER:

F24F1/00(2011.01)i
F24F13/08(2006.01)i
F24F13/22(2006.01)i

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