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(71) Applicant: **Gree Electric Appliances, Inc. of Zhuhai**
Zhuhai, Guangdong 519070 (CN)

(72) Inventors:
- **CHEN, Hongguang**
  Zhuhai
  Guangdong 519070 (CN)
- **PAN, Longteng**
  Zhuhai
  Guangdong 519070 (CN)
- **QIU, Xiaohong**
  Zhuhai
  Guangdong 519070 (CN)
- **WANG, Chaoxin**
  Zhuhai
  Guangdong 519070 (CN)
- **LI, Deqing**
  Zhuhai
  Guangdong 519070 (CN)
- **ZENG, Hui**
  Zhuhai
  Guangdong 519070 (CN)
- **LIN, Yuliang**
  Zhuhai
  Guangdong 519070 (CN)
- **ZHANG, Yongcheng**
  Zhuhai
  Guangdong 519070 (CN)
- **ZHAN, Qingzhong**
  Zhuhai
  Guangdong 519070 (CN)
- **JIA, Feifei**
  Zhuhai
  Guangdong 519070 (CN)
- **FU, Kaikai**
  Zhuhai
  Guangdong 519070 (CN)

(74) Representative: **V.O.**
P.O. Box 87930
2508 DH Den Haag (NL)

(54) **WATER RECEIVING TRAY ASSEMBLY AND AIR CONDITIONING**

(57) Disclosed is a water receiving tray assembly. The water receiving tray assembly includes a water receiving tray body (1) and a first stopper (2), wherein the water receiving tray body (1) includes a first area (11) for receiving condensation water flowing from an air duct component (3), a second area (12) communicating with a drain pipe, and a groove (13) located between the first area (11) and the second area (12); the first stopper (2) has a first end and a second end, wherein the first end is fixed on the water receiving tray body (1), and the second end extends into the groove (13) and is at a predetermined distance from a bottom surface of the groove (13), and when a height of a condensation water in the groove (13) is greater than the predetermined distance, the condensation water in the groove (13) contacts with the first stopper (2) to form a sealed windshield structure. An air conditioner using the above water receiving tray assembly is also disclosed.

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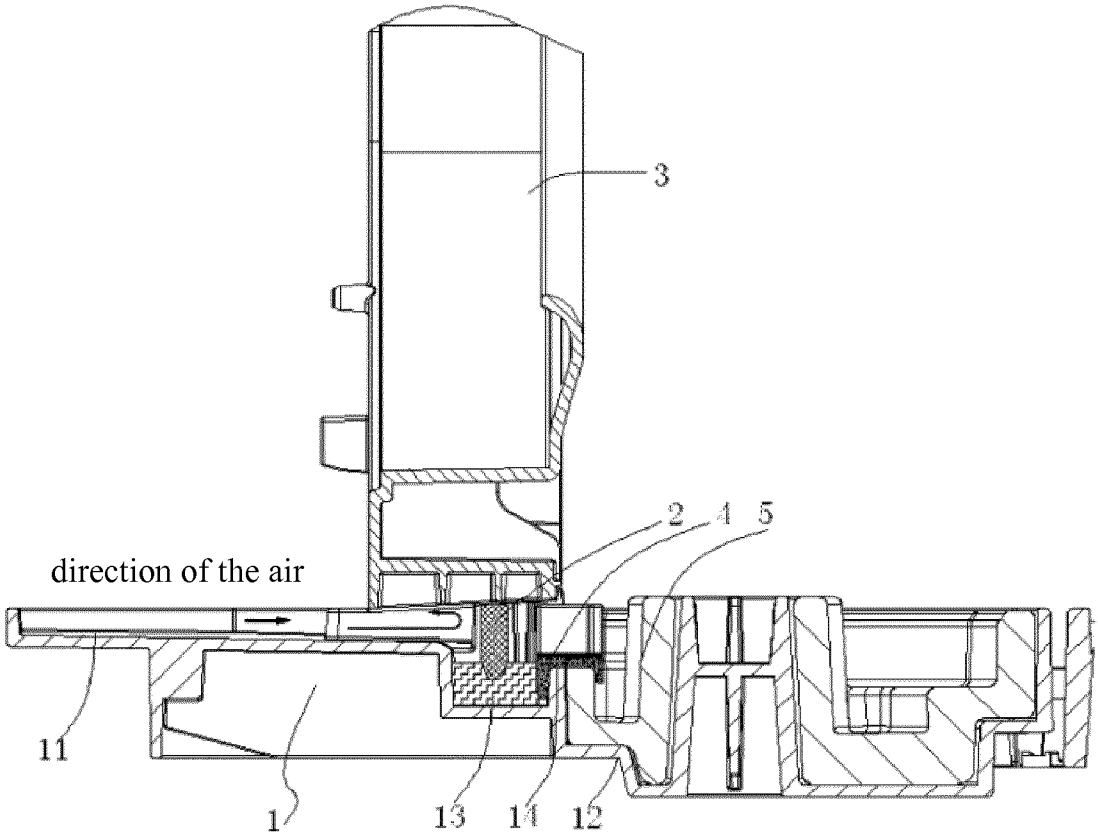

Fig. 1

Description

Technical Field

[0001] The disclosure relates to a technical field of heat exchange, and in particular to a water receiving tray assembly and an air conditioner.

Background

[0002] At present, when a water receiving tray is applied to an air conditioner system, the water receiving tray may be configured to receive condensation water produced in use of an air duct component, and then the condensation water may be drained by the water receiving tray through a drain pipe connected with the water receiving tray. For the air conditioner system in use, it is necessary for the air duct component to be barrier-free when an air comes in and to prevent air leakage when the air goes out, thus guaranteeing the efficient operation of the air conditioner system.

[0003] However, for the existing cabinet air conditioner, an area below the air duct component opposite to the water receiving tray is a high-pressure area; and an area at the drain pipe opposite to the water receiving tray is a low-pressure area. During use, when the air goes out from the air duct component, a part of air is blown from the high-pressure area to the low-pressure area to cause the air leakage, and as a result, the air volume of the air duct component is obviously reduced.

[0004] Therefore, it is necessary to improve the structure of the existing water receiving tray, so that the water receiving tray can prevent the air from being blown from the high-pressure area to the low-pressure area while a received condensation water flows through and thus the reduction in the air volume of the air duct component is prevented.

Summary

[0005] Some embodiments of the present disclosure provide a water receiving tray assembly and an air conditioner, which can prevent air from being blown from a high-pressure area to a low-pressure area when condensation water flows through and thus prevents the reduction in air volume of an air duct component.

[0006] An embodiment of the present disclosure provides a water receiving tray assembly, which includes: a water receiving tray body and a first stopper; wherein the water receiving tray body includes a first area for receiving condensation water flowing from an air duct component, a second area communicating with a drain pipe, and a groove located between the first area and the second area; and the first stopper has a first end and a second end, herein the first end is fixed on the water receiving tray body and the second end extends into the groove and is at a predetermined distance from a bottom surface of the groove; when a height of a condensation water in the groove is greater than the predetermined distance, the condensation water in the groove contacts with the first stopper to form a sealed windshield structure.

[0007] In an exemplary embodiment, a protruded transition portion is formed at a transition position between the second area and the groove, and an upper surface of the transition portion is not higher than a water-out position of the first area and is higher than the second end of the first stopper.

[0008] In an exemplary embodiment, the first area is provided with an upper surface for flowing through the condensation water; and the upper surface of the first area is provided with a downward predetermined inclination angle along a flowing direction of the condensation water.

[0009] In an exemplary embodiment, a clamping groove is formed at a position, opposite to the groove, of the water receiving tray body, and the first stopper is fixed on the water receiving tray body by the clamping groove.

[0010] In an exemplary embodiment, the first stopper and the water receiving tray body are of an integrally moulded structure.

[0011] In an exemplary embodiment, a barrier layer is disposed on a surface of the second area.

[0012] In an exemplary embodiment, the water receiving tray assembly further includes a second stopper; the second stopper is located at a transition position between the groove and the second area; and the second stopper is in clearance fit with the water receiving tray body and the barrier layer.

[0013] An air conditioner includes the above-mentioned water receiving tray assembly.

[0014] According to the water receiving tray assembly and the air conditioner provided by the disclosure, the first stopper is disposed above the groove between the first area and the second area of the water receiving tray body, and the first stopper can extend into the groove and a predetermined distance is formed between the first stopper and the bottom surface of the groove; and when the height of the condensation water in the groove is greater than the predetermined distance in use, the condensation water in the groove contacts the first stopper to form the sealed windshield structure. Therefore, the water permeable and airtight effect is implemented, and while the condensation water is guaranteed to flow normally, the air is prevented from being blown from the high-pressure area to the low-pressure area and thus the air volume of the air duct component may be guaranteed.

Brief Description of the Drawings

[0015] The accompanying drawings are described here to provide a further understanding of the present disclosure. The schematic embodiments and description of the present disclosure are adopted to explain the present disclosure, and do not form improper limits to the present disclosure. In the drawings:

Fig. 1 illustrates a structural schematic diagram of a water receiving tray assembly in an embodiment of the present disclosure.

Fig. 2 illustrates a structural schematic diagram showing that a water receiving tray assembly is applied to an air conditioner in an embodiment of the present disclosure.

[0016] Numerals in the drawings:
1. water receiving tray body; 2. first stopper; 3. air duct component; 11. first area; 12. second area; 13. groove; 14. transition portion; 4. second stopper; 5. barrier layer.

Detailed Description of the Embodiments

[0017] Details of the present disclosure can be understood more clearly in combination with accompanying drawings and description on the specific embodiments of the present disclosure. However, the specific embodiments of the present disclosure described here are merely for explaining the present disclosure and cannot be understood as limits to the present disclosure in any form. Under the teaching of the present disclosure, it may be conceivable for a technician to make any possible variation based on the present disclosure and all should be considered as the scope of the present disclosure.

[0018] It is to be noted that when an element is referred to as being "on" another element, it can be directly on the other element or intervening elements may be present therebetween. Also, when an element is referred to as being "connected to" another element, it can be directly connected to the element or intervening elements may be present therebetween. The terms "install", "connected with", "connected to" should be comprehended in a broad sense. For example, these terms may be comprehended as being mechanically connected or electrically connected, may also be comprehended as being communicated inside two elements, may be comprehended as being directly connected and may also be comprehended as being connected indirectly via intermediation. The specific meanings about the foregoing terms in the present application may be understood by those skilled in the art according to specific circumstances. The present disclosure will be described below in detail with reference to the accompanying drawings and in combination with the embodiments.

[0019] The embodiments of the present disclosure provide a water receiving tray assembly and an air conditioner capable of preventing air from being blown from a high-pressure area to a low-pressure area while condensation water flows through and thus preventing the reduction of the air volume of an air duct component.

[0020] Referring to Fig. 1, a water receiving tray assembly provided by the embodiments of the present disclosure may include: a water receiving tray body 1 and a first stopper 2; the water receiving tray body 1 includes a first area 11 for receiving condensation water flowing from an air duct component 3, a second area 12 communicating with a drain pipe, and a groove 13 located between the first area 11 and the second area 12; and the first stopper 2 has a first end and a second end, wherein the first end is fixed on the water receiving tray body 1 and the second end extends into the groove 13 and a predetermined distance is formed between the second end and a bottom surface of the groove 13.

[0021] When a height of a condensation water in the groove 13 is greater than the predetermined distance, the condensation water in the groove 13 contacts with the first stopper 2 to form a sealed windshield structure.

[0022] In this embodiment, the water receiving tray body 1 is configured to receive the condensation water flowing from the air duct component 3 and guide the condensation water to the drain pipe connected therewith; and the condensation water is drained by the drain pipe. Specifically, the water receiving tray body 1 includes the first area 11 for receiving the condensation water flowing from the air duct component 3, the second area 12 communicating with the drain pipe, and the groove 13 located between the first area 11 and the second area 12, wherein an area where the first area 11 is located is a high-pressure area, and an area where the second area 12 is located is a low-pressure area.

[0023] In this embodiment, the first area 11 is located below the outflowed condensation water; and when the condensation water flows downward under an action of gravity, it can be completely flowed into the first area 11 of the water receiving tray body 1.

[0024] In an exemplary embodiment, the first area 11 is provided with an upper surface for flowing through the condensation water; and the upper surface of the first area is provided with a downward predetermined inclination angle along a flowing direction of the condensation water. Specifically, the predetermined inclination angle is formed on the upper surface of the first area 11 for receiving the condensation water. After the condensation water enters the first area 11, the condensation water flows downward along the upper surface of the first area 11 for receiving the condensation water under the action of the gravity, sequentially flows through the groove 13 and the second area 12 and at last is drained from the drain pipe, and is not accumulated in the first area 11.

[0025] In an exemplary embodiment, the predetermined inclination angle is formed during mould withdrawal of the water receiving tray body 1 and is the same as a mould withdrawal angle. Certainly, the predetermined inclination angle may further be formed in other machining manners, and is not specifically defined by the present disclosure. Besides, the predetermined inclination angle may be selected as 2-10° , so that the condensation water can flow downward smoothly. Certainly, the magnitude of the predetermined inclination angle is not limited to the above example and is not specifically defined in the present disclosure.

[0026] In this embodiment, an overall surface height of the second area 12 is smaller than a surface height of

the first area 11, and the second area 12 communicates with the drain pipe, so that the condensation water flows into the drain pipe for draining.

[0027] In an exemplary embodiment, when the condensation water flows from the first area 11 corresponding to the high-pressure area to the second area 12 corresponding to the low-pressure area, the temperature of the condensation water is low. By providing a barrier layer 5 on the surface of the second area 12, the low-temperature condensation water is stopped from directly contacting the surface of the second area 12 and thus the condensation water is prevented from forming on a lower surface of the second area 12.

[0028] In an exemplary embodiment, the barrier layer 5 is made of foam. Certainly, the material of the barrier layer 5 is not limited to the above example, may further be other material and is not specifically defined in the present disclosure.

[0029] In this embodiment, the groove 13 is formed between the first area 11 and the second area 12, the first stopper 2 is disposed on the water receiving tray body 1 above the groove 13, and the first stopper 2 is cooperated with the condensation water in the groove 13 to form the windshield structure that is water permeable and airtight.

[0030] In an exemplary embodiment, the first stopper 2 is of a structure having one block piece and is provided with a first end and a second end that are opposite, wherein the first end is fixed on the water receiving tray body 1, and the second end extends into the groove 13, and a predetermined distance is formed between the second end and the bottom surface of the groove 13 to preserve a flowing port for the condensation water.

[0031] In this embodiment, the first stopper 2 is specifically cooperated with the receiving tray body in a clamping groove fixing manner.

[0032] Specifically, a clamping groove is formed at a position, opposite to the groove 13, of the water receiving tray body 1, and the first stopper 2 is fixed on the water receiving tray body 1 by the clamping groove.

[0033] The first stopper 2 may be fixed in the clamping groove in a clearance fit manner. At this moment, the first stopper 2 may be made of a rubber with elasticity. Certainly, the material of the first stopper 2 may further be other forms and is not specifically defined in the present disclosure.

[0034] When the first stopper 2 is made of the rubber and is clamped in the clamping groove in the clearance fit manner, the sealing property between the first stopper 2 and the water receiving tray body 1 in cooperation also can be guaranteed, and the air is prevented from being blown from the high-pressure area to the low-pressure area to affect the air volume of the air duct component 3.

[0035] In another specific embodiment, the first stopper 2 and the water receiving tray body 1 are of an integrally moulded structure.

[0036] In this embodiment, the first stopper 2 may be integrally moulded with the water receiving tray body 1. When the first stopper 2 is integrally moulded with the water receiving tray, the sealing property for the cooperative positions of the first stopper and the receiving tray body can also be guaranteed, and the air is prevented from being blown from the high-pressure area to the low-pressure area to affect the air volume of the air duct component 3.

[0037] In one embodiment, a protruded transition portion 14 is formed at a transition position between the second area 12 and the groove 13, and an upper surface of the transition portion 14 is not higher than a water-out position of the first area 11 and is higher than the second end of the first stopper 2.

[0038] In this embodiment, the protruded transition portion 14 is formed at the transition position between the second area 12 and the groove 13, and the upper surface of the transition portion 14 may be lower than the water-out position of the first area 11 or is flush with the water-out position of the first area 11. Specifically, the water-out position of the first area 11 may be referred to a position transited with the groove 13. In general, the water-out position of the first area 11 is a lowest position of the first area 11. When the upper surface of the transition portion 14 is not higher than a water-out position of the first area 11, the height to which the condensation water in the groove 13 can reach is determined by a height of the upper surface of the transition portion 14. Additionally, the upper surface of the transition portion 14 is higher than the second end of the first stopper 2, so it is ensured that when the condensation water is accumulated in the groove 13, the height of the condensation water can exceed the second end of the first stopper 2 to form a sealed windshield structure with the first stopper.

[0039] In an exemplary embodiment, the water receiving tray assembly further includes a second stopper 4, the second stopper 4 is located at a transition position between the groove 13 and the second area 12, and the second stopper 4 is in clearance fit with the water receiving tray body 1 and the barrier layer 5.

[0040] In this embodiment, the second stopper 4 is disposed at the transition position between the groove 13 and the second area 12, and the second stopper 4 may be in clearance fit with the water receiving tray body 1 and the barrier layer 5. In an exemplary embodiment, the second stopper 4 includes a top surface and a first side surface and a second side surface disposed at two sides of the top surface, wherein the first side surface is abutted against a sidewall, transited with the groove 13, of the second area 12, and the second side surface may be abutted against the barrier layer 5. The top surface contacts the transition position between the groove 13 and the second area 12 as well as the barrier layer 5.

[0041] Certainly, the shape of the second stopper 4 may change correspondingly according to an actual application environment and is not specifically defined in the present disclosure.

[0042] When the second stopper 4 is in clearance fit

with the water receiving tray body 1 and the barrier layer 5, the second stopper 4 may be made of a rubber with elasticity. Certainly, the material of the second stopper 4 may be in other forms and is not specifically defined in the present disclosure.

[0043] When the second stopper 4 is made of the rubber, the second stopper is coated out of the transition position between the groove 13 and the second area 12 as well as the barrier layer 5 in a clearance fit manner, so that the sealing property at the cooperative positions between the second stopper 4, the water receiving tray body 1 and the barrier layer 5 can be guaranteed and the condensation water is prevented from being leaked therefrom.

[0044] When the water receiving tray assembly of some embodiments of the present disclosure is used actually, the condensation water in the groove 13 contacts the first stopper 2 to form the sealed windshield structure. At this moment, the condensation water can flow into the second area 12 by the flowing port between the first stopper 2 and the groove 13 for draining, and the air cannot be penetrated through under a sealing action of the windshield structure. Therefore, the water receiving tray assembly can automatically form the sealed windshield structure in use to implement the water permeable and airtight effect; and while the condensation water is guaranteed to flow normally, the air is prevented from being blown from the high-pressure area to the low-pressure area, and thus the air volume of the air duct component 3 may be guaranteed.

[0045] According to the water receiving tray assembly in this embodiment of the present disclosure, the first stopper 2 is disposed above the groove 13 between the first area 11 and the second area 12 of the water receiving tray body 1, and the first stopper 2 can extend into the groove 13 and a predetermined distance is formed between the first stopper 2 and the bottom surface of the groove 13; and when the height of the condensation water in the groove 13 is greater than the predetermined distance in use, the condensation water in the groove 13 contacts the first stopper 2 to form the sealed windshield structure. Therefore, the water permeable and airtight effect is implemented, and while the condensation water is guaranteed to flow normally, the air is prevented from being blown from the high-pressure area to the low-pressure area and thus the air volume of the air duct component 3 may be guaranteed.

[0046] Referring to Fig. 2, the embodiments of the present disclosure further provide an air conditioner including the water receiving tray assembly in the above-mentioned any embodiment.

[0047] When the air conditioner including the water receiving tray assembly in the present disclosure is used, after the startup of the air conditioner, condensation water is produced on an air duct component 3, and the condensation water flows into a first area 11 of a water receiving tray body 1 under an action of gravity and flows into a groove 13 along the first area. When the condensation water in the groove 13 contacts a first stopper 2, a sealed windshield structure is formed. At this moment, the condensation water can flow into a second area 12 by a flowing port between the first stopper 2 and the groove 13 for draining, and the air cannot be passed through under the sealing action of the windshield structure. Therefore, the water receiving tray assembly can automatically form the sealed windshield structure in use to implement the water permeable and airtight effect, and while the condensation water is guaranteed to flow normally, the air is prevented from being blown from a high-pressure area to a low-pressure area, and thus the air volume of the air duct component 3 is guaranteed.

[0048] In addition, the structure of the water receiving tray assembly and technical effects produced by the structural improvements correspondingly are corresponding to the embodiments of the water receiving tray assembly and will not be repeated herein.

[0049] Certainly, the above-mentioned water receiving tray assembly is not limited to be used in the air conditioner, and may further be used in the fields such as a refrigerator, which is not specifically defined in the present disclosure. Each embodiment of the present disclosure is described in a progressive manner, and the same or similar part in each embodiment may be referred to each other. The top priority in each embodiment is given to the difference from other embodiments.

[0050] The above is only the optional embodiments of the present disclosure and not intended to limit the present disclosure. For those skilled in the art, the present disclosure may have various modifications and variations. Any modifications, equivalent replacements, improvements and the like made within the spirit and principle of the present disclosure shall fall within the scope of protection of the present disclosure.

Claims

1. A water receiving tray assembly, comprising: a water receiving tray body (1) and a first stopper (2), wherein the water receiving tray body (1) comprises a first area (11) for receiving condensation water flowing from an air duct component (3), a second area (12) communicating with a drain pipe, and a groove (13) located between the first area (11) and the second area (12); and the first stopper (2) has a first end and a second end, wherein the first end is fixed on the water receiving tray body (1) and the second end extends into the groove (13) and is at a predetermined distance from a bottom surface of the groove (13); and
   when a height of a condensation water in the groove (13) is greater than the predetermined distance, the condensation water in the groove (13) contacts with the first stopper (2) to form a sealed windshield structure.

2. The water receiving tray assembly as claimed in claim 1, wherein a protruded transition portion (14) is formed at a transition position between the second area (12) and the groove (13), and an upper surface of the transition portion (14) is not higher than a water-out position of the first area (11) and is higher than the second end of the first stopper (2).

3. The water receiving tray assembly as claimed in claim 1, wherein the first area (11) is provided with an upper surface for flowing through the condensation water, and the upper surface of the first area is provided with a downward predetermined inclination angle along a flowing direction of the condensation water.

4. The water receiving tray assembly as claimed in claim 1, wherein a clamping groove is formed at a position, opposite to the groove (13), of the water receiving tray body (1), and the first stopper (2) is fixed on the water receiving tray body (1) by the clamping groove.

5. The water receiving tray assembly as claimed in claim 1, wherein the first stopper (2) and the water receiving tray body (1) are of an integrally moulded structure.

6. The water receiving tray assembly as claimed in claim 1, wherein a barrier layer (5) is disposed on a surface of the second area (12).

7. The water receiving tray assembly as claimed in claim 6, wherein the water receiving tray assembly further comprises a second stopper (4), the second stopper (4) is located at a transition position between the groove (13) and the second area, and the second stopper (4) is in clearance fit with the water receiving tray body (1) and the barrier layer (5).

8. An air conditioner, comprising the water receiving tray assembly as claimed in any one of claims 1 to 7.

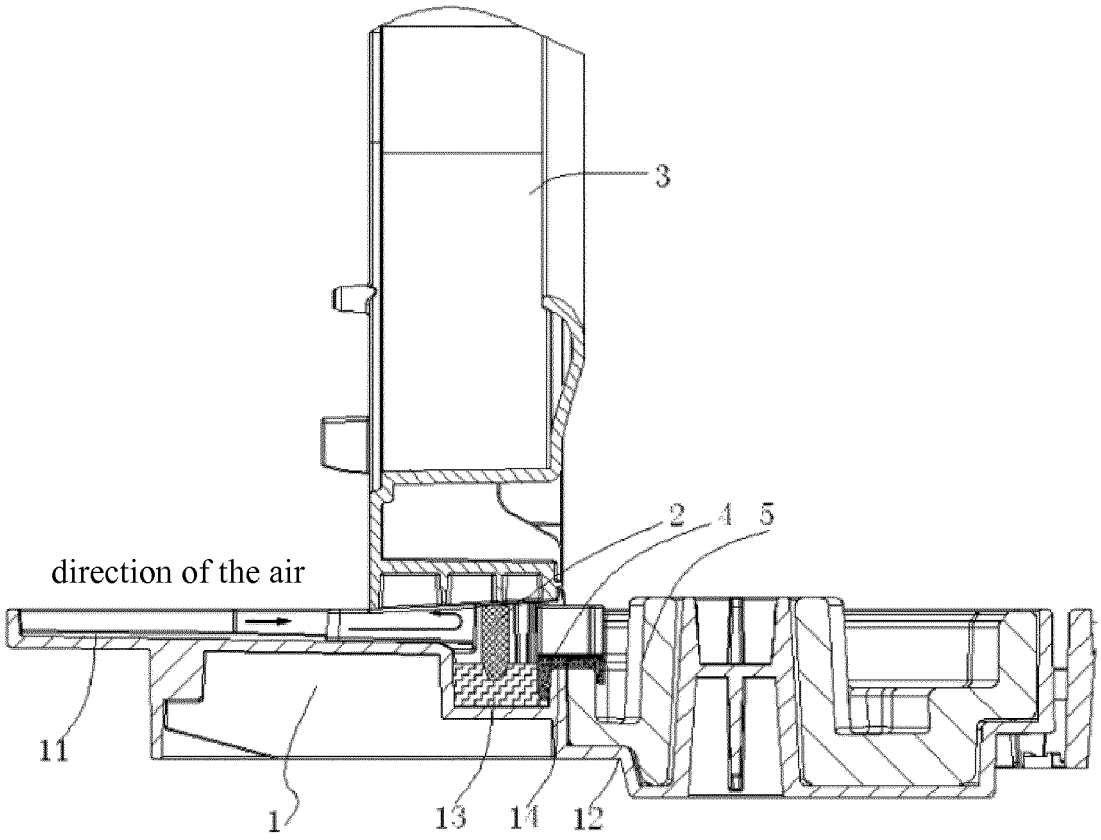

Fig. 1

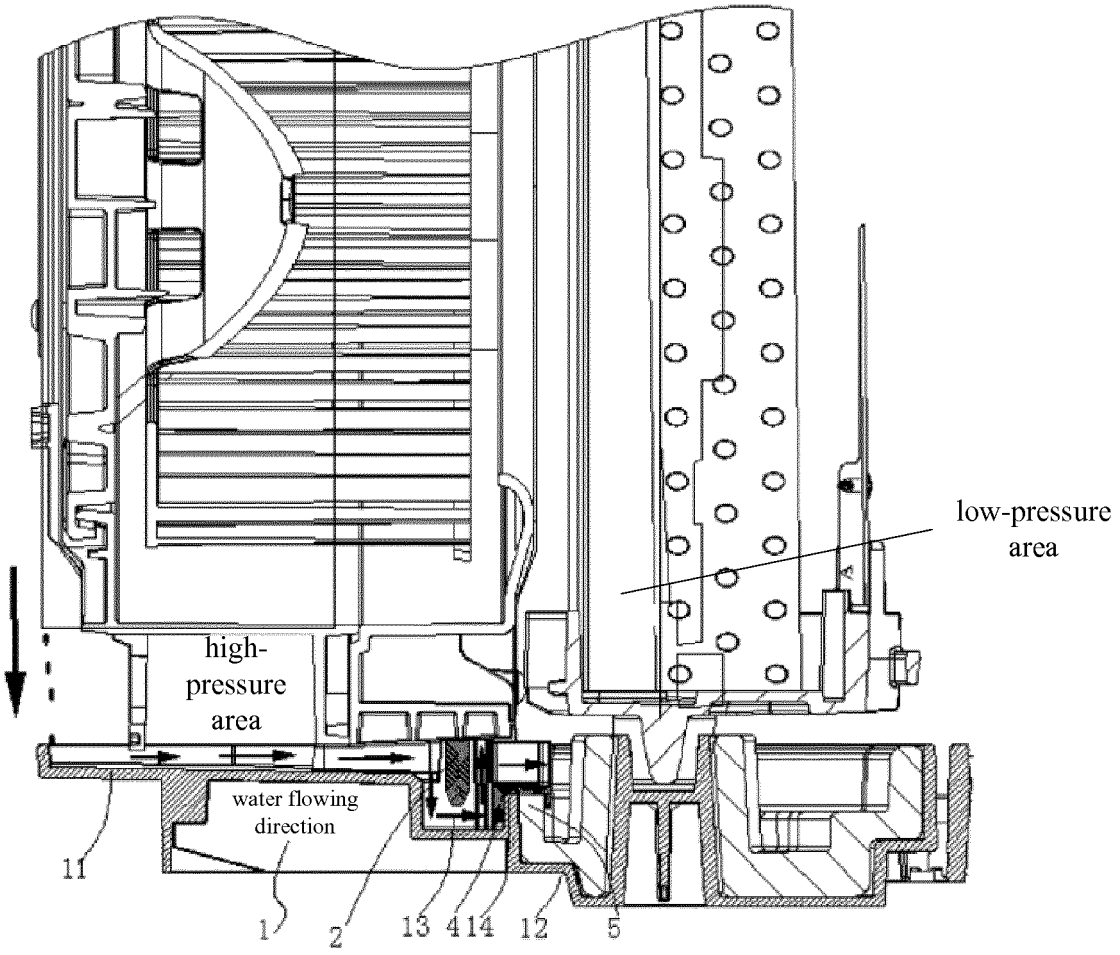
low-pressure area
high-pressure area
water flowing direction
11
1
2
13
4
14
12
5

Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/100689

A. CLASSIFICATION OF SUBJECT MATTER

F24F 13/22 (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)

CNKI, CNPAT, CNABS, CNTXT, VEN, WPI, EPODOC: (空调, 接水盘, 风道, 挡块, 凹槽, 密封; air conditioner, water, drain, receiving, pan, wind, block, groove, seal)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 206191855 U (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 24 May 2017 (24.05.2017), claims 1-8	1-8
PX	CN 106352528 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 25 January 2017 (25.01.2017), claims 1-8	1-8
A	CN 201246863 Y (GUANGDONG MIDEA ELECTRIC APPLIANCES CO., LTD.), 27 May 2009 (27.05.2009), description, page 2, lines 1 to 14, and figures 1-2	1-8
A	CN 105115138 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI), 02 December 2015 (02.12.2015), entire document	1-8
A	JP 2005133974 A (NITTO ELECTRIC WORKS LTD.), 26 May 2005 (26.05.2005), entire document	1-8

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
04 December 2017	14 December 2017
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer ZHANG, Yang Telephone No. (86-10) 62084045

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2017/100689

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 206191855 U	24 May 2017	None	
CN 106352528 A	25 January 2017	None	
CN 201246863 Y	27 May 2009	None	
CN 105115138 A	02 December 2015	None	
JP 2005133974 A	26 May 2005	JP 4257843 B2	22 April 2009

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