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# (54) EVAPORATOR SUPPORT STRUCTURE AND AIR CONDITIONER HAVING EVAPORATOR SUPPORT STRUCTURE

(57) An evaporator (100) support structure and an air conditioner having the evaporator (100) support structure. The evaporator (100) support structure comprises a base (1) used to mount an evaporator (100) and a support portion (2) provided on the base (1) and used to support the evaporator (100). The support portion (2) comprises a first support body (21) and a second support body (22) arranged to form an angle. In a longitudinal cross-section, the support portion (2) has a V-shape opening towards the exterior of the base (1). The first support body (21) is located above the second support body (22). Atop surface of the first support body (21) forms a flat support surface (211) used to support the evaporator (100). The flat support surface (211) used to support the bottom of the evaporator (100) is provided on one side of the first support body (21) facing the interior of the base (1), such that a support area between the first support body (21) and the bottom of the evaporator (100) is increased, and surface-to-surface supporting is achieved, thereby improving supporting stability.

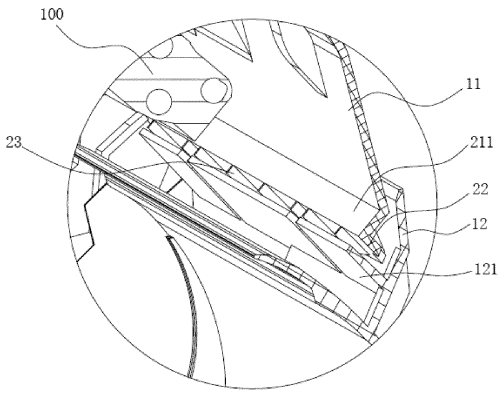


FIG. 7

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## Description

**[0001]** The application claims priority to the Chinese patent application No.201822144168.6 filed on December 20, 2018, the entire disclosure of which is incorporated herein by reference as part of the present application.

TECHNICAL FIELD

**[0002]** Embodiments of the present disclosure relate to an evaporator support structure and an air conditioner having the evaporator support structure.

BACKGROUND

**[0003]** An air conditioner in the existing technology has a base 1' provided with multi-layered support ribs 2' upon assembling with an evaporator in order to support the evaporator, and there are a plurality of support ribs 2' spaced apart in each layer. As the support ribs 2' gradually extend obliquely upward towards the inside of the base 1', water is easily accumulated on the support ribs 2'. The gap between two adjacent support ribs 2' in each layer forms drainage channels 13'. Since the drainage channels 13' in each layer are staggered and arranged like a maze, it is very unfavorable for draining the water. Due to the structure of the support ribs, the mold has a complex structure with great difficulty to fabricate product and affecting the strength of the base 1'. When the top end of a support rib 2' abuts against the bottom of the evaporator, the support area is small because of the line support, so the stability is poor and the ribs are readily collapsed.

SUMMARY

**[0004]** In view of this, the embodiments of the present disclosure aim to provide an evaporator support structure to solve the problems of small supporting area, poor stability and collapsing issue in the above-mentioned existing technology.

**[0005]** To achieve the above objectives, the technical solution of the present disclosure is realized as follows: An evaporator support structure includes a base for installing an evaporator and a support portion arranged on the base for supporting the evaporator. The support portion includes a first support body and a second support body arranged at an angle with respect to each other. The support portion has a V-shaped longitudinal section with an opening facing towards an outside of the base. The first support body is located on the second support body, and the first support body has a top surface with one side facing towards an inside of the base forming a support plane for supporting the evaporator.

**[0006]** Further, the base includes a first base and a second base arranged below the first base, and the support portion is formed at the bottom end of the first base.

**[0007]** Further, the first support body gradually extends obliquely downward towards the inside of the base from the bottom end of the first base.

**[0008]** Further, a plurality of first reinforcing ribs extending longitudinally for supporting the evaporator are arranged on one side of the second support body towards the inside of the base.

**[0009]** Further, the first reinforcing rib has a top flush with an end of the supporting plane of the first support body facing towards the inside of the base.

**[0010]** Further, a plurality of second reinforcing ribs are arranged between opposite sides of the first support body and the second support body.

**[0011]** Further, the second reinforcing rib is attached to both the first support body and the second support body to have a V-shape with an opening facing towards the outside of the base.

**[0012]** Further, the second base is provided with at least one water guiding rib which extends longitudinally upwards and is configured to support the evaporator, and the water guiding rib is located inside the support portion.

**[0013]** Compared with the existing technology, the evaporator support structure according to the embodiments of the present disclosure has following advantages:

(1) By designing the part of the support portion used for supporting the evaporator as a plane, the surface contact is formed between the support portion and the evaporator, which increases the contact area for supporting, so that the base provides a more stable support for the evaporator.

(2) The first support body is surface-supported with the bottom of the evaporator and gradually extends obliquely downward towards the inside of the base, so that the drainage is smoother.

(3) A plurality of first reinforcing ribs with tops flush with the end of the supporting plane of the first support body facing towards the inside of the base are arranged longitudinally and spaced apart on the second support body, which further increases the contact area with the bottom of the evaporator, and is also beneficial to guide the water while improving the support stability.

(4) A plurality of second reinforcing ribs are longitudinally arranged and spaced apart between the opposite sides of the first support body and the second support body, which enhances the overall strength of the support portion.

(5) The water guiding rib arranged on the second base is cooperated with the support portion to form a support for the bottom of the evaporator, so that the base provides a more stable support for the evaporator. In addition, the first reinforcing ribs also have a support function and abut against the water guiding rib, and a cooperation between the first reinforcing ribs and the water guiding rib can reduce the contact area between the first base and the second base

and reduce the abnormal noise caused by the relative displacement of the first base and the second base during air conditioner operation.

**[0014]** Another objective of the embodiments of the present disclosure is to provide an air conditioner having the above evaporator support structure to solve the problem of poor stability in the existing technology.

**[0015]** To achieve the above objectives, the technical solution of the present disclosure is realized as follows: An air conditioner having the evaporator support structure as described above includes an evaporator. The evaporator and the evaporator support structure supporting the evaporator constitute a part of an indoor unit of the air conditioner.

**[0016]** Compared with the existing technology, the air conditioner described in the embodiments of the present disclosure has following advantages:

Through the cooperation of the base and the support portion, the contact area for supporting the evaporator is increased, so that the base provides a more stable for the evaporator.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0017]** The drawings forming a part of the present disclosure are used to provide a further understanding of the present disclosure, and the exemplary embodiments and descriptions thereof are used to explain the present disclosure, and do not constitute an improper limitation of the present disclosure. In the attached drawings:

FIG. 1 is a schematic diagram of a base and supporting ribs of an evaporator support structure in the existing technology;

FIG. 2 is a schematic front view of an evaporator support structure in embodiments of the present disclosure;

FIG. 3 is an enlarged view of part I of FIG. 2;

FIG. 4 is a schematic back view of an evaporator support structure in embodiments of the present disclosure;

FIG. 5 is an enlarged view of part II of FIG. 4;

FIG. 6 is a sectional view of a base of an evaporator support structure and an evaporator in embodiments of the present disclosure; and

FIG. 7 is an enlarged view of part III of FIG. 6.

**[0018]** Description of reference numerals: 1(1')- base, 11- first base, 12- second base, 121- water guiding rib, 13'- drainage channel, 2- support portion, 2'- supporting rib, 21- first support body, 211- supporting plane, 22- second support body, 23 - first reinforcing rib, 24- second reinforcing rib, 100- evaporator.

## DETAILED DESCRIPTION

**[0019]** It should be noted that the embodiments in the present disclosure and the features in the embodiments can be combined with each other without conflict.

**[0020]** Hereinafter, the present disclosure will be described in detail with reference to the drawings and in combination with embodiments.

**[0021]** Referring to Figs. 2-5, an evaporator support structure includes a base 1 for installing an evaporator 100 and a support portion 2 arranged on the base 1 for supporting the evaporator 100.

**[0022]** The base 1 includes a first base 11 and a second base 12 arranged below the first base 11. The support portion 2 is formed at a bottom end of the first base 11 and staggered with a top end of the second base 12. For convenience of description, hereinafter, the inside of the base 1 refers to the side of the base 1 where the evaporator 100 is installed, and the outside of the base 1 refers to the side of the base 1 away from the evaporator 100.

**[0023]** Referring to Fig. 6 and Fig. 7, the support portion 2 includes a first support body 21 and a second support body 22 arranged at an angle with respect to each other, and the support portion 2 has a V-shaped longitudinal section with an opening facing towards the outside of the base 1. The first support body 21 gradually extends obliquely downward towards the inside of the base 1 from the bottom end of the first base 11, while the second support body 21 gradually extends obliquely downward towards the outside of the base 1 from a bottom end of the first support body 211, thus the V-shaped support portion 2 is formed. The first support body 21 has a top surface (the surface facing towards the inside of the base 1), and the top surface is a plane and in contact with the evaporator 100 to form a support plane 211 for supporting the evaporator 100. In this way, a support structure is changed from line contact of the existing technology to surface contact, which can make the support more stable.

**[0024]** The support portion 2 further includes a plurality of first reinforcing ribs 23 extending longitudinally which are arranged and spaced apart on one side of the second support body 22 facing towards the inside of the base 1. The top of the first reinforcing rib 23 is flush with the end of the supporting plane 211 of the first support body 21 facing towards the inside of the base 1, so that the first reinforcing ribs 23 and the first support body 21 can support the bottom of the evaporator 100 at the same time, which increases the contact area, provides a more stable support, and is beneficial to guide water to flow away along the first reinforcing ribs 23. The first reinforcing ribs 23 may have the same inclination direction and angle as the first support body 22.

**[0025]** Referring to Fig. 4 and Fig. 5, a plurality of second reinforcing ribs 24 are arranged between opposite sides (two inner sides of the V-shaped opening) of the first support body 21 and the second support body 22. For example, the second reinforcing ribs 24 can be completely attached to both the first support body 21 and the second support body 22 to have a V-shape with an opening facing towards the outside of the base 1. The second

reinforcing ribs 24 not only improve the strength of the support portion 2, but also facilitate water guidance.

**[0026]** Referring to Fig. 3 and Fig 7, the second base 12 is provided with at least one water guiding rib 121 which extends longitudinally upwards and is used for supporting the evaporator 100, and the water guiding rib 121 is arranged on the support portion 2, especially on an inner side of the first reinforcing ribs 23 (the side facing towards the inside of the base 1). The support portion 2, together with the water guiding rib 121, supports the bottom of the evaporator 100, which greatly improves the stability of the evaporator 100 supported on the base 1. In addition, the above-mentioned first reinforcing ribs 23 also have a support function and abut against the water guiding rib 121, which can reduce the contact area between the first base 11 and the second base 12, and reduce the abnormal noise caused by the relative displacement of the first base 11 and the second base 12 during air conditioner operation.

**[0027]** The above evaporator support structure and the evaporator constitute a part of an indoor unit of an air conditioner.

**[0028]** The above are only some embodiments of the present disclosure, and are not used to limit the present disclosure. Any modifications, equivalent substitutions, improvements, etc. made within the spirits and principles of the present disclosure should be included in the protection scope of the present disclosure.

## Claims

1. An evaporator support structure, comprising: a base (1) for installing an evaporator (100) and a support portion (2) arranged on the base (1) for supporting the evaporator (100), **characterized in that**, the support portion (2) comprises a first support body (21) and a second support body (22) arranged at an angle with respect to each other, the support portion (2) has a V-shaped longitudinal section with an opening facing towards an outside of the base (1), the first support body (21) is located on the second support body (22), and the first support body (21) has a top surface forming a support plane (211) for supporting the evaporator (100).

2. The evaporator support structure according to claim 1, **characterized in that**, the base (1) comprises a first base (11) and a second base (12) arranged below the first base (11), and the support portion (2) is formed at a bottom end of the first base (11).

3. The evaporator support structure according to claim 2, **characterized in that**, the first support body (21) gradually extends obliquely downward towards an inside of the base (1) from the bottom end of the first base (11).

4. The evaporator support structure according to claim 2, **characterized in that**, a plurality of first reinforcing ribs (23) extending longitudinally for supporting the evaporator (100) are arranged on one side of the second support body (22) facing towards an inside of the base (1).

5. The evaporator support structure according to claim 4, **characterized in that**, the first reinforcing rib (23) has a top flush with an end of the supporting plane (211) of the first support body (21) facing towards the inside of the base (1).

6. The evaporator support structure according to claim 3, **characterized in that**, a plurality of second reinforcing ribs (24) are arranged between opposite sides of the first support body (21) and the second support body (22).

7. The evaporator support structure according to claim 6, **characterized in that**, the second reinforcing rib (24) is attached to both the first support body (21) and the second support body (22) to have a V-shape with an opening facing towards the outside of the base (1).

8. The evaporator support structure according to any one of claims 2-7, **characterized in that**, the second base (12) is provided with at least one water guiding rib (121) which extends longitudinally upwards and is used for supporting the evaporator (100), and the water guiding rib (121) is located inside the support portion (2).

9. An air conditioner having the evaporator support structure according to any one of claims 1-8, comprising: an evaporator (100), **characterized in that**, the evaporator (100) and the evaporator support structure supporting the evaporator (100) constitute a part of an indoor unit of the air conditioner.

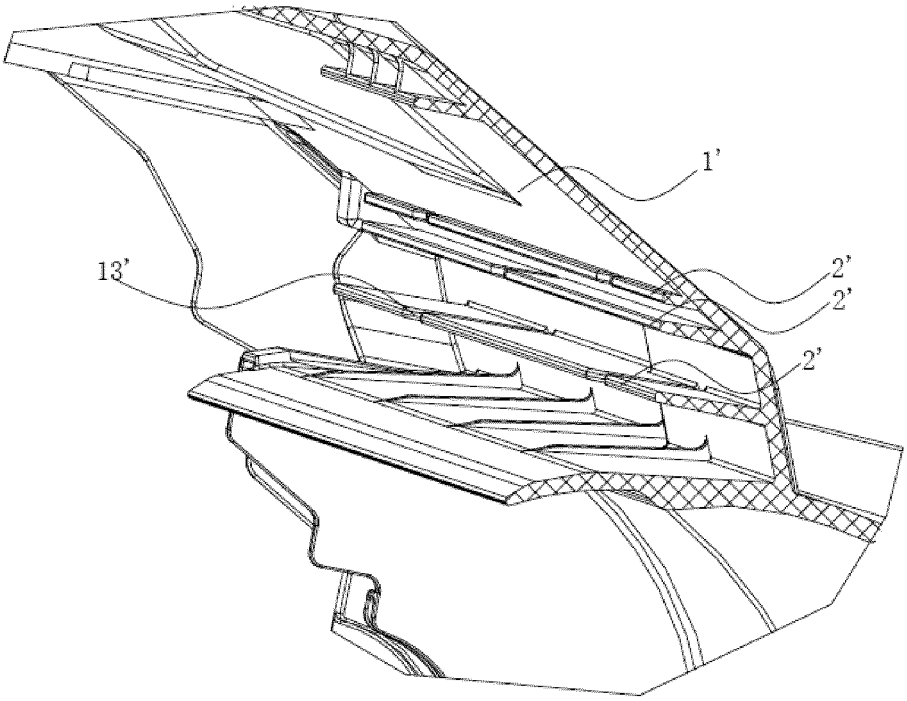


FIG. 1

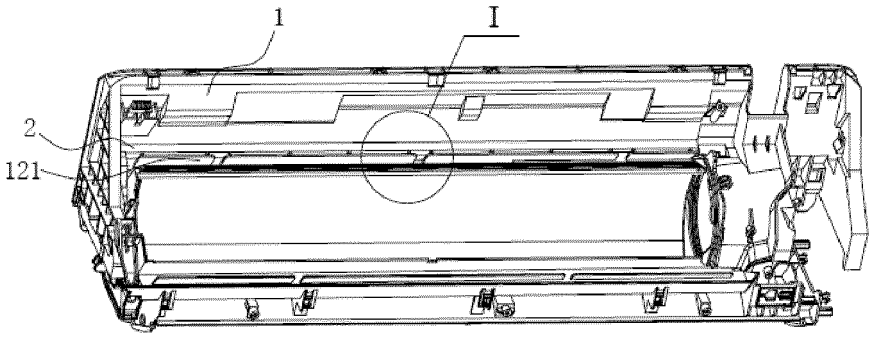


FIG. 2

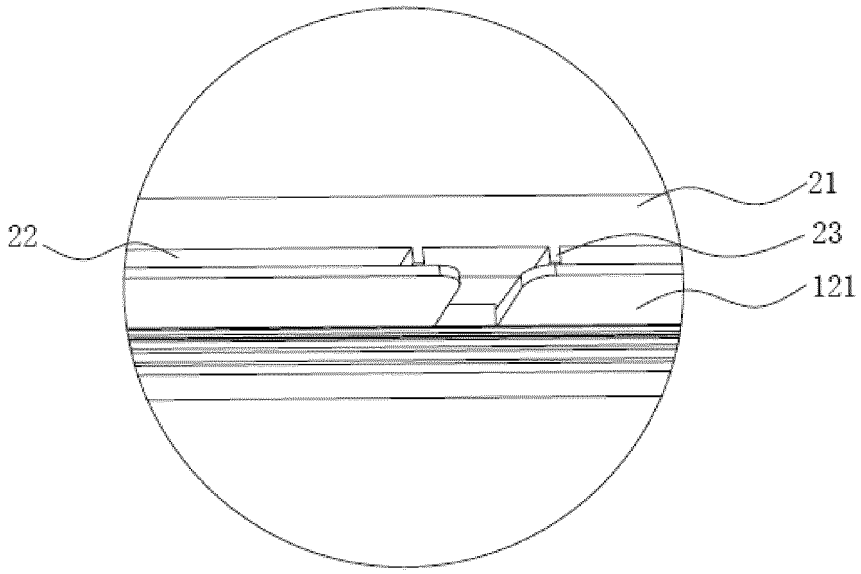


FIG. 3

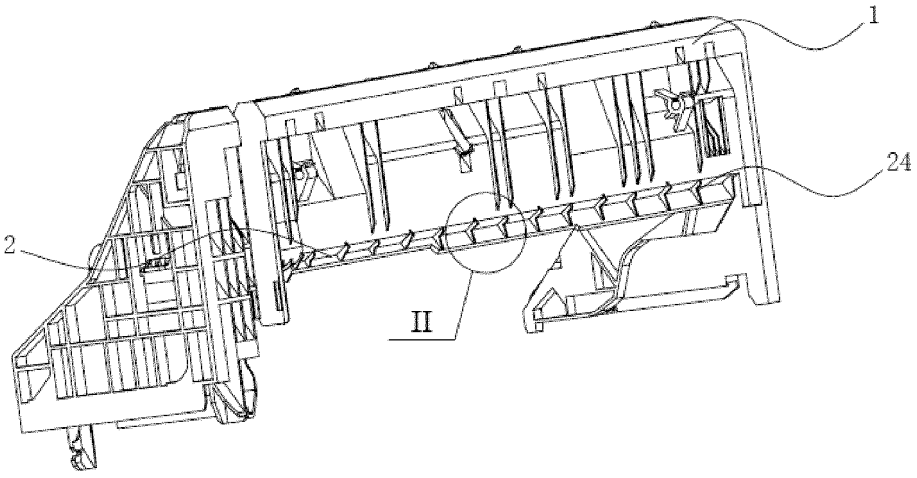


FIG. 4

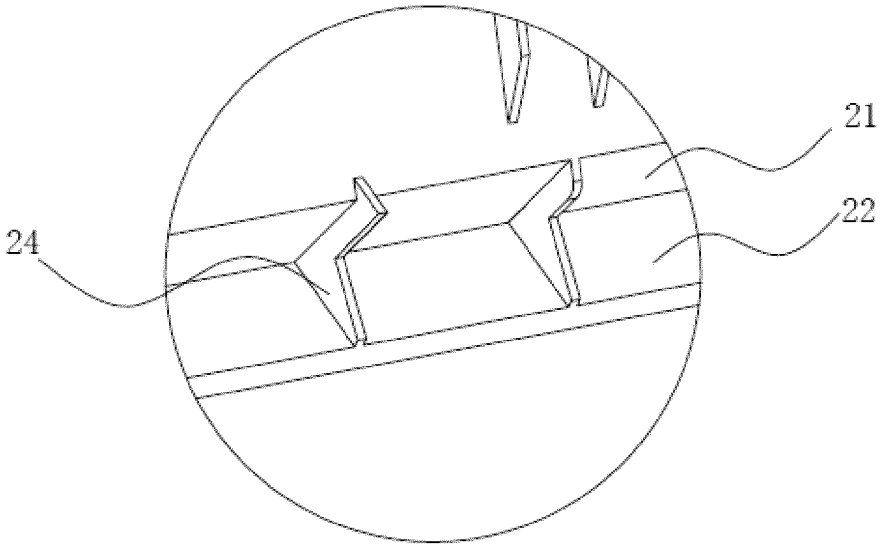


FIG. 5

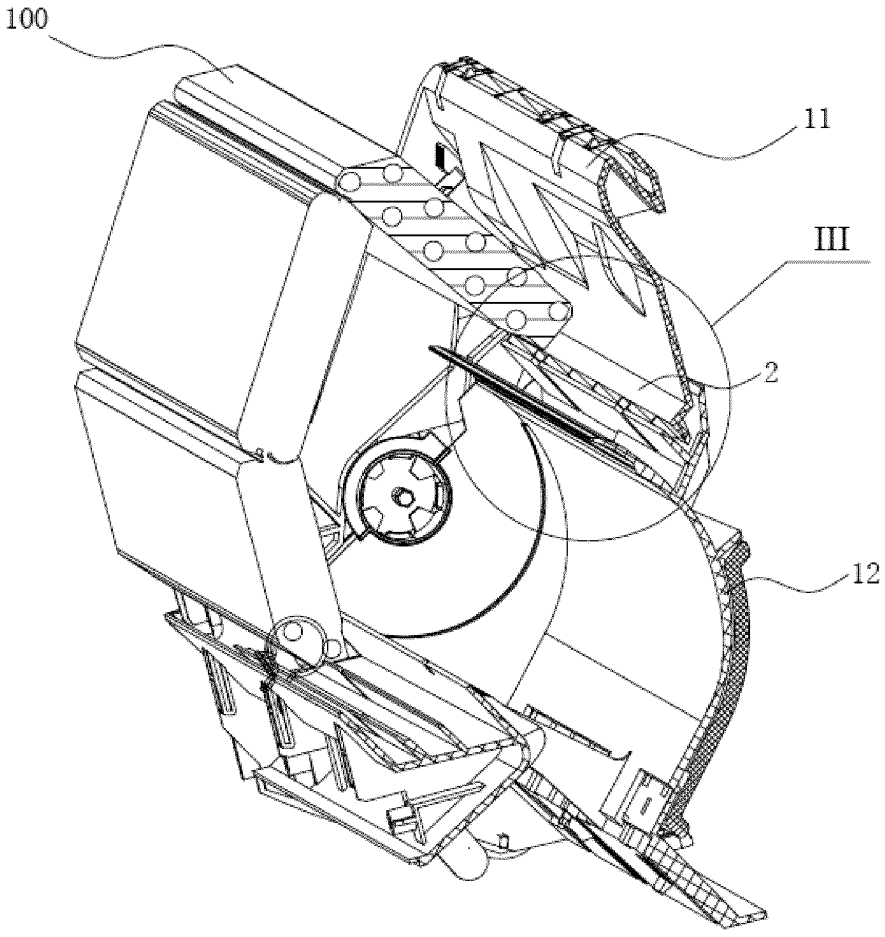


FIG. 6

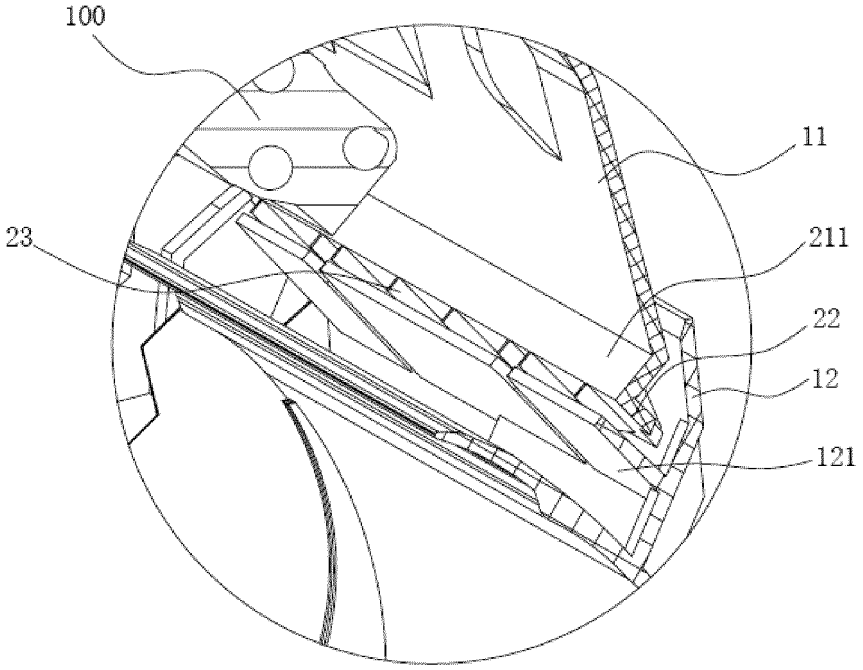


FIG. 7

**INTERNATIONAL SEARCH REPORT**

International application No.
**PCT/CN2019/125144**

**A. CLASSIFICATION OF SUBJECT MATTER**

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)

F24F13/20;; F24F13 /10;; F24F 13/00;; F24F1/16;; F24F 1/14;; F24F1/00

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, CNABS, CNTXT, CNKI: 空调; 室内机; 蒸发器; 支撑; 底座; 插接; 配合; 加强筋; 排水; 损坏; 散热片; air condition; indoor?; evaporator; support; base; splice; fitting; stiffener; drain; bending; fin

**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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| A | US 2017268789 A1 (GD MIDEA AIR-CONDITIONING EQUIPMENT CO., LTD. et al.) 21 September 2017 (2017-09-21)<br>entire document | 1-9 |

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| **01 March 2020** | **12 March 2020** |
| Name and mailing address of the ISA/CN<br>**China National Intellectual Property Administration (ISA/CN)**<br>**No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088**<br>**China** | Authorized officer |
| Facsimile No. **(86-10)62019451** | Telephone No. |

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/125144

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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**INTERNATIONAL SEARCH REPORT**
**Information on patent family members**

International application No.
**PCT/CN2019/125144**

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## REFERENCES CITED IN THE DESCRIPTION

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