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(72) Inventor: **SHAN, Lianyu**
Beijing, 100085 (CN)

(74) Representative: **dompatent von Kreisler Selting
Werner -
Partnerschaft von Patent- und Rechtsanwälten
mbB
Deichmannhaus am Dom
Bahnhofsvorplatz 1
50667 Köln (DE)**

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(71) Applicant: **Beijing Xiaomi Mobile Software Co.,
Ltd.
Beijing 100085 (CN)**

(54) **ROTARY BLADE STRUCTURE FOR CYLINDRICAL CABINET INDOOR UNIT AND
CYLINDRICAL CABINET INDOOR UNIT**

(57) A rotary blade structure for a cylindrical cabinet indoor unit and a cylindrical cabinet indoor unit are provided. The rotary blade structure for the cylindrical cabinet indoor unit includes a shaft sleeve (1), a sweep blade (2) and an air-duct mounting frame (3). The sweep blade (2) is arranged at the air-duct mounting frame (3), both ends of the sweep blade (2) are rotatably connected with the air-duct mounting frame (3), and at least one of the both ends of the sweep blade (2) is rotatably connected with the air-duct mounting frame (3) through the shaft sleeve (1).

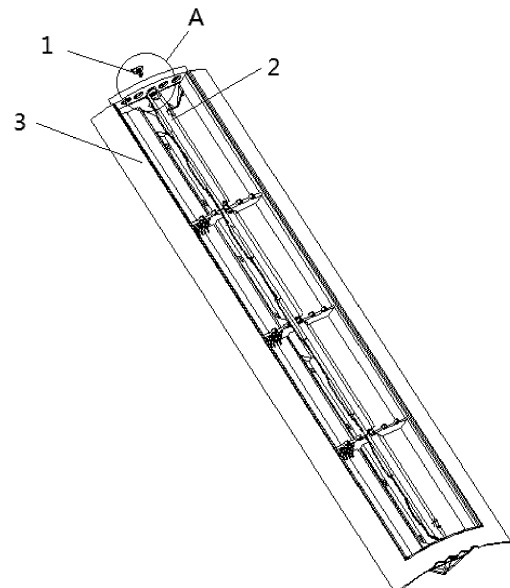


FIG. 1

Description

FIELD

[0001] The present disclosure relates to a technical field of a cabinet machine, and more particularly to a rotary blade structure for a cylindrical cabinet indoor unit and a cylindrical cabinet indoor unit.

BACKGROUND

[0002] A product such as a cabinet indoor unit of an air conditioner, a cabinet air conditioner fan, a cabinet air purifier or the like has a sweep blade structure. An air output direction is changed by rotation of the sweep blade. The sweep blade of the traditional cabinet indoor unit is directly fitted with a mounting hole of an air duct, and a clearance reserved between the sweep blade and the mounting hole is relatively large, so that the sweep blade always has a continuous shake when rotating normally, thus greatly affecting a user experience.

SUMMARY

[0003] As such, it is necessary to propose a rotary blade structure for a cylindrical cabinet indoor unit so as to solve the problem of the shake of a sweep blade during rotation due to an assembling vacancy.

[0004] In order to at least partially solve the above problems, embodiments of a first aspect the present disclosure provide a rotary blade structure for a cylindrical cabinet indoor unit. The rotary blade structure for the cylindrical cabinet indoor unit includes a shaft sleeve, a sweep blade and an air-duct mounting frame, the sweep blade is arranged at the air-duct mounting frame, both ends of the sweep blade are rotatably connected with the air-duct mounting frame, and at least one of the both ends of the sweep blade is rotatably connected with the air-duct mounting frame through the shaft sleeve.

[0005] Optionally, the shaft sleeve is provided with a shaft hole running through the shaft sleeve at the position of an axis of the shaft sleeve.

[0006] Optionally, the shaft sleeve includes a positioning post, a limiting rib and a snap, the limiting rib is arranged at one end of the positioning post and parallel to an end face of the one end of the positioning post, and the snap is arranged at the other end of the positioning post and perpendicular to an end face of the other end of the positioning post.

[0007] Optionally, the snap includes a limiting post and a snapping leg, one end of the limiting post is fixedly connected with the positioning post, an outer peripheral wall of the limiting post is provided with symmetrical cut planes, and the snapping leg is arranged at the cut plane and extends away from the positioning post.

[0008] Optionally, the limiting post and the positioning post are coaxially arranged, and the snapping leg is arranged perpendicularly to the end face of the positioning

post.

[0009] Optionally, an end portion of the snapping leg is provided with a snapping tab inclined towards the limiting post.

[0010] Optionally, a side of the snapping leg adjacent to the shaft hole is provided with a groove along a length direction of the snapping leg.

[0011] Optionally, both ends of the limiting rib extend beyond an outer peripheral wall of the positioning post.

[0012] Optionally, an end portion of the sweep blade connected with the shaft sleeve is provided with a snapping collar corresponding to the snap.

[0013] Optionally, the snap is snapped with the sweep blade through the snapping collar.

[0014] Optionally, a plurality of round holes are formed in a side wall of the air-duct mounting frame connected with the shaft sleeve, and the round hole corresponds to the positioning posts.

[0015] Optionally, the positioning post of the shaft sleeve is mounted in the round hole and configured to rotate in the round hole.

[0016] Optionally, a difference between a diameter of the round hole and a diameter of the positioning post ranges from 0.2mm to 0.4mm.

[0017] Embodiments of a second aspect of the present disclosure further provide a cylindrical cabinet indoor unit. The cylindrical cabinet indoor unit includes the rotary blade structure for the cylindrical cabinet indoor unit in any of the above embodiments.

[0018] Optionally, the cylindrical cabinet indoor unit further includes: an indoor unit body; a mounting panel arranged at the indoor unit body; and an air duct assembly arranged at the mounting panel, and including the rotary blade structure for the cylindrical cabinet indoor unit.

[0019] Compared with the related art, the present disclosure at least includes following beneficial effects.

[0020] In the rotary blade structure for the cylindrical cabinet indoor unit of the present disclosure, through the arrangement of the shaft sleeve, the sweep blade is indirectly and rotatably connected with the air-duct mounting frame through the shaft sleeve, and the rotation fit of the shaft sleeve and the air-duct mounting frame reduces the shake amount of the sweep blade during normal rotation, so as to solve the problem of the shake of the sweep blade during operation, enhance the stability and smoothness of the sweep blade during rotation, and improve the user experience.

[0021] Other advantages, objectives and features of the rotary blade structure for the cylindrical cabinet indoor unit described in the present disclosure will be partially reflected by the following descriptions, and also will be partially understood by those skilled in the related art according to research and practice of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The accompanying drawings provide a further understanding of the present disclosure and constitute as part of the present disclosure. The accompanying drawings are configured to explain the present disclosure with the embodiments of the present disclosure, which do not constitute as a limitation of the present disclosure.

FIG. 1 is an exploded view of an overall rotary blade structure for a cylindrical cabinet indoor unit according to an embodiment the present disclosure.

FIG. 2 is an enlarged view of part A of the rotary blade structure for the cylindrical cabinet indoor unit in FIG. 1.

FIG. 3 is a schematic view of an overall shaft sleeve in a rotary blade structure for a cylindrical cabinet indoor unit according to an embodiment to the present disclosure.

FIG. 4 is a schematic view of a snap of a shaft sleeve in a rotary blade structure for a cylindrical cabinet indoor unit according to an embodiment the present disclosure.

FIG. 5 is a schematic view of connection between a shaft sleeve and a sweep blade in a rotary blade structure for a cylindrical cabinet indoor unit according to an embodiment the present disclosure.

FIG. 6 is an enlarged view of part B of the rotary blade structure for the cylindrical cabinet indoor unit in FIG. 5.

FIG. 7 is a schematic view of an overall cylindrical cabinet indoor unit according to an embodiment the present disclosure.

DETAILED DESCRIPTION

[0023] The present disclosure is further described in detail below in combination with the accompanying drawings and embodiments, such that those skilled in the related art may implement the present disclosure with reference to the literal content of the descriptions.

[0024] It should be understood that terms such as "having," "including," and "comprising" as used herein do not exclude an existence or addition of one or more other elements or combinations thereof.

[0025] As illustrated in FIG. 1-FIG. 7, the present disclosure provides a rotary blade structure for a cylindrical cabinet indoor unit, including: a shaft sleeve 1, a sweep blade 2 and an air-duct mounting frame 3. The air-duct mounting frame 3 is provided with a plurality of sweep blades 2, and both ends of the sweep blade 2 are rotatably connected with the air-duct mounting frame 3, and at least one of the both ends of the sweep blade 2 is rotatably connected with the air-duct mounting frame 3 through the shaft sleeve 1.

[0026] In this embodiment, the plurality of sweep blades 2 are provided on the air-duct mounting frame 3, and the sweep blade 2 is rotatably connected with the

air-duct mounting frame 3 through the shaft sleeve 1. An upper end of the sweep blade 2 is preferably rotatably connected with the air-duct mounting frame 3 through the shaft sleeve 1, or upper and lower ends of the sweep blade 2 each may also be rotatably connected with the air-duct mounting frame 3 through the shaft sleeve 1. The shaft sleeve 1 at the upper end of the sweep blade 2 is connected with an output shaft of a motor. When the motor rotates, the shaft sleeve 1 is driven to rotate, such that the shaft sleeve 1 drives the sweep blade 2 to rotate.

[0027] Through the arrangement of the shaft sleeve 1, the sweep blade 2 is indirectly and rotatably connected with the air-duct mounting frame 3 through the shaft sleeve 1, and a rotation fit of the shaft sleeve 1 and the air-duct mounting frame 3 reduces a shake amount of the sweep blade 2 during a normal rotation, so as to solve the problem of the shake of the sweep blade 2, thus enhancing the stability and smoothness of the sweep blade 2 during rotation, and improving the user experience.

[0028] In an embodiment, the shaft sleeve 1 is provided with a shaft hole 1-1 running through the shaft sleeve 1 at the position of an axis of the shaft sleeve 1, the shaft sleeve 1 includes a positioning post 1-2, a limiting rib 1-3 and a snap 1-4, one end of the positioning post 1-2 is provided with the limiting rib 1-3 parallel to an end face of the one end of the positioning post 1-2, and the other end of the positioning post 1-2 is provided with the snap 1-4 perpendicular to an end face of the other end of the positioning post 1-2.

[0029] In this embodiment, the output shaft of the motor is configured to be fitted in the shaft hole 1-1 formed in the shaft sleeve 1. When the shaft sleeve 1 rotates in the air-duct mounting frame 3, the positioning post 1-2 and the limiting rib 1-3 are configured to have radial and axial limitations on the shaft sleeve 1, respectively, and the snap 1-4 is configured to be snapped with the sweep blade 2 to ensure that the shaft sleeve 1 drives the sweep blade 2 to rotate together.

[0030] Through the above configuration, the shaft hole 1-1 formed in the shaft sleeve 1 may ensure that the motor drives the shaft sleeve 1 to rotate in the air-duct mounting frame 3 when rotating, and the limiting rib 1-3 may prevent the shaft sleeve 1 from falling out of the air-duct mounting frame 3 when the shaft sleeve 1 rotates, and the positioning post 1-2 may ensure a stable rotation of the shaft sleeve 1 in the air-duct mounting frame 3, so as to prevent a large radial offset of the shaft sleeve 1 and hence to solve the problem of the shake of the sweep blade 2. The snap 1-4 is snapped with the sweep blade 2, such that it is very convenient to assemble and disassemble the shaft sleeve 1 with/from the sweep blade 2 on the premise of ensuring a firm connection therebetween.

[0031] In an embodiment, the snap 1-4 includes a limiting post 1-4-1 and a snapping leg 1-4-2, and one end of the limiting post 1-4-1 is fixedly connected with the positioning post 1-2. The limiting post 1-4-1 and the positioning post 1-2 are coaxially arranged. An outer pe-

ripheral wall of the limiting post 1-4-1 is provided with symmetrical cut planes 1-4-1-1, and the snapping leg 1-4-2 is arranged at the cut plane 1-4-1-1 and extends away from the positioning post 1-2. The snapping leg 1-4-2 is arranged perpendicularly to the end face of the positioning post 1-2.

[0032] In this embodiment, the snap 1-4 is configured to be snapped with the sweep blade 2, the limiting post 1-4-1 and the snapping leg 1-4-2 are inserted into an end portion of the sweep blade 2, and the snapping leg 1-4-2 has a certain deformation ability. Before being inserted, the snapping leg 1-4-2 is deformed and gets close to a center of the shaft sleeve 1. After being inserted into the end portion of the sweep blade 2, the snapping leg 1-4-2 is snapped with the end portion of the sweep blade 2. The limiting post 1-4-1 may be inserted into the end portion of the sweep blade 2, and a relative rotation between the sweep blade 2 and the shaft sleeve 1 may be prevented through the cut planes 1-4-1-1 on the outer peripheral wall of the limiting post 1-4-1.

[0033] Through the above configuration, the joint co-operation of the limiting post 1-4-1 and the snapping leg 1-4-2 allows the snap 1-4 to be firmly snapped with the sweep blade 2, and further ensures that the sweep blade 2 may rotate together with the shaft sleeve 1.

[0034] In an embodiment, an end portion of the snapping leg 1-4-2 is provided with a snapping tab 1-4-3 inclined towards the limiting post 1-4-1.

[0035] In this embodiment, after passing through the end portion of the sweep blade 2, the snapping leg 1-4-2 is snapped with the end portion of the sweep blade 2 through the snapping tab 1-4-3, so that the snapping leg 1-4-2 is prevented from moving outwards.

[0036] Through the above configuration, the snapping tab 1-4-3 arranged at the end portion of the snapping leg 1-4-2 may prevent the snapping leg 1-4-2 from being separated from the end portion of the sweep blade 2, thus further ensuring the stability of the connection between the shaft sleeve 1 and the sweep blade 2.

[0037] In an embodiment, a side of the snapping leg 1-4-2 adjacent to the shaft hole 1-1 is provided with a groove 1-4-2-1 along its length direction.

[0038] In this embodiment, the arrangement of the groove 1-4-2-1 facilitates the deformation of the snapping leg 1-4-2 during mounting on the premise of ensuring the strength of the snapping leg 1-4-2.

[0039] Through the above configuration, it is more convenient for assembling and disassembling of the snapping leg 1-4-2 and the sweep blade 2 on the premise of ensuring the connection strength of the snapping leg 1-4-2 and the sweep blade 2. If the sweep blade 2 or the shaft sleeve 1 is damaged, it may be replaced in time, which further facilitates the use thereof.

[0040] In an embodiment, both ends of the limiting rib 1-3 extend beyond an outer peripheral wall of the positioning post 1-2.

[0041] In this embodiment, when the shaft sleeve 1 is mounted to the air-duct mounting frame 3, the limiting rib

1-3 is arranged on an outer side of the air-duct mounting frame 3, the positioning post 1-2 is arranged in a side wall of the air-duct mounting frame 3, and the snap 1-4 is arranged on an inner side of the air-duct mounting frame 3. The snap 1-4 is connected with the sweep blade 2 arranged on the inner side of the air-duct mounting frame 3, and the limiting rib 1-3 is configured to prevent a relative axial movement of the shaft sleeve 1 and the sweep blade 2.

[0042] Through the above configuration, when the sweep blade 2 rotates, the limiting rib 1-3 may prevent the shake of the sweep blade 2 due to a displacement of the sweep blade 2 in its length direction, thus further ensuring the stability of the sweep blade 2 during operation.

[0043] In an embodiment, the end portion of the sweep blade 2 connected with the shaft sleeve 1 is provided with a snapping collar 2-1 corresponding to the snap 1-4.

[0044] In this embodiment, the snap 1-4 is snapped with the sweep blade 2 through the snapping collar 2-1, and both the limiting post 1-4-1 and the snapping leg 1-4-2 may be inserted into the snapping collar 2-1. After the snapping leg 1-4-2 is inserted into the snapping collar 2-1, the snapping tab 1-4-3 at the end portion of the snapping leg 1-4-2 passes through the snapping collar 2-1 and is snapped with the snapping collar 2-1. The limiting post 1-4-1 may be inserted into the snapping collar 2-1, and the snapping collar 2-1 corresponds to the limiting post 1-4-1 in shape and size. The limiting post 1-4-1 is fitted with the snapping collar 2-1 through the cut planes 1-4-1-1 on the outer peripheral wall of the limiting post 1-4-1, thus preventing a relative rotation of the shaft sleeve 1 and the sweep blade 2. Accordingly, an inner peripheral surface of the snapping collar 2-1 should be provided with other cut planes matching with the cut planes 1-4-1-1 on the outer peripheral wall of the limiting post 1-4-1.

[0045] Through the above configuration, the fit of the snapping collar 2-1 and the snapping tab 1-4-3 prevents an axial displacement of the shaft sleeve 1, and the fit of the limiting post 1-4-1 and the snapping collar 2-1 prevents the relative rotation of the shaft sleeve 1 and the sweep blade 2, thus ensuring the stability of the connection between the shaft sleeve 1 and the sweep blade 2, and further ensuring the stability of the sweep blade 2 during operation.

[0046] In an embodiment, a plurality of round holes 3-1 are formed in the side wall of the air-duct mounting frame 3 connected with the shaft sleeve 1, and the round hole 3-1 corresponds to the positioning post 1-2.

[0047] In this embodiment, the plurality of round holes 3-1 are formed in the side wall of the air-duct mounting frame 3 connected with the shaft sleeve 1. The positioning post 1-2 of the shaft sleeve 1 is mounted in the round hole 3-1 and is configured to rotate in the round hole 3-1.

[0048] Through the above configuration, a rotary connection between the positioning post 1-2 of the shaft sleeve 1 and the air-duct mounting frame 3 has a smaller

clearance, so as to further achieve a more stable rotary connection between the sweep blade 2 snapped with the shaft sleeve 1 and the air-duct mounting frame 3. Compared to the direct rotary connection between the sweep blade 2 and the air-duct mounting frame 3 in the related art, it has advantages of the small clearance and the stable connection, thus solving the problem of the shake of the sweep blade 2 during operation and hence bringing a better experience to users.

[0049] In an embodiment, a difference between a diameter of the round hole 3-1 and a diameter of the positioning post 1-2 ranges from 0.2mm to 0.4mm.

[0050] In this embodiment, the difference between the diameters of the round hole 3-1 and the positioning post 1-2 has a small range, which further ensures that the positioning post 1-2 will not shake greatly in the round hole 3-1 during rotation, on the premise that the positioning post 1-2 may rotate smoothly in the round hole 3-1.

[0051] The difference between the diameters of the round hole 3-1 and the positioning post 1-2 has the small range, which ensures the rotation stability of the shaft sleeve 1 and the sweep blade 2, reduces the shake amount of the sweep blade 2 during operation, and thus eliminates the shake of the sweep blade 2 during operation.

[0052] The present disclosure also provides a cylindrical cabinet indoor unit, including the rotary blade structure for the cylindrical cabinet indoor unit described in any of the above embodiments.

[0053] In this embodiment, the cylindrical cabinet indoor unit includes an indoor unit body 4, a mounting panel 5, and an air duct assembly 6, the mounting panel 5 is arranged at the indoor unit body 4, the air duct assembly 6 is arranged at the mounting panel 5, and the air duct assembly 6 includes the rotary blade structure for the cylindrical cabinet indoor unit described in any of the above embodiments.

[0054] When the cylindrical cabinet indoor unit adopting the rotary blade structure for the cylindrical cabinet indoor unit is used, the sweep blade 2 rotates, and a shake of the sweep blade 2 relative to the air-duct mounting frame 3 during rotation may be reduced through the arrangement of the shaft sleeve 1, so as to prevent the shake of the sweep blade 2, enhance the stability and smoothness of the sweep blade 2 during rotation, and improve the user experience.

[0055] In the description of the present disclosure, it should be understood that, terms such as "central," "longitudinal," "lateral," "length," "width," "thickness," "upper," "lower," "front," "rear," "left," "right," "vertical," "horizontal," "top," "bottom," "inner," "outer," "clockwise," "counter clockwise," "axial," "radial," and "circumferential" indicate an orientation or a position relationship based on an orientation or a position relationship illustrated in the accompanying drawings, which is only for convenience of descriptions or for simplifying descriptions of the present disclosure, and does not indicate or imply that the device or element referred to must have a

particular orientation or be constructed and operated in a specific orientation, and hence cannot be construed as limitation to the present disclosure.

[0056] In the present disclosure, it should be noted that, unless specified otherwise, terms such as "mounted," "coupled," "connected," and "fixed," should be understood broadly. The terms may indicate, for example, fixed connections, detachable connections, or integral connections, may also indicate mechanical or electrical connections or mutual communications, may also indicate direct connections or indirect connections via intermediate mediums, and may also indicate an inner communication of two elements or an interaction between two elements. The specific meanings of the terms in embodiments of the present disclosure may be understood by those skilled in the related art according to particular circumstances.

Claims

1. A rotary blade structure for a cylindrical cabinet indoor unit, comprising:
 - an air-duct mounting frame (3);
 - a sweep blade (2) arranged at the air-duct mounting frame (3), both ends of the sweep blade (2) being rotatably connected with the air-duct mounting frame (3); and
 - a shaft sleeve (1), at least one of the both ends of the sweep blade (2) being rotatably connected with the air-duct mounting frame (3) through the shaft sleeve (1).
2. The rotary blade structure for the cylindrical cabinet indoor unit according to claim 1, wherein the shaft sleeve (1) is provided with a shaft hole (1-1) running through the shaft sleeve (1) at the position of an axis of the shaft sleeve (1).
3. The rotary blade structure for the cylindrical cabinet indoor unit according to claim 2, wherein the shaft sleeve (1) comprises:
 - a positioning post (1-2);
 - a limiting rib (1-3) arranged at one end of the positioning post (1-2) and parallel to an end face of the one end of the positioning post (1-2); and
 - a snap (1-4) arranged at the other end of the positioning post (1-2) and perpendicular to an end face of the other end of the positioning post (1-2).
4. The rotary blade structure for the cylindrical cabinet indoor unit according to claim 3, wherein the snap (1-4) comprises a limiting post (1-4-1) and a snapping leg (1-4-2), one end of the limiting post (1-4-1) is fixedly connected with the positioning post (1-2),

an outer peripheral wall of the limiting post (1-4-1) is provided with symmetrical cut planes (1-4-1-1), and the snapping leg (1-4-2) is arranged at the cut plane (1-4-1-1) and extends away from the positioning post (1-2).

5. The rotary blade structure for the cylindrical cabinet indoor unit according to claim 4, wherein the limiting post (1-4-1) and the positioning post (1-2) are coaxially arranged, and the snapping leg (1-4-2) is arranged perpendicularly to the end face of the positioning post (1-2). 5
6. The rotary blade structure for the cylindrical cabinet indoor unit according to claim 4 or 5, wherein an end portion of the snapping leg (1-4-2) is provided with a snapping tab (1-4-3) inclined towards the limiting post (1-4-1). 10
7. The rotary blade structure for the cylindrical cabinet indoor unit according to any one of claims 4 to 6, wherein a side of the snapping leg (1-4-2) adjacent to the shaft hole (1-1) is provided with a groove (1-4-2-1) along a length direction of the snapping leg (1-4-2). 15
8. The rotary blade structure for the cylindrical cabinet indoor unit according to any one of claims 3 to 7, wherein both ends of the limiting rib (1-3) extend beyond an outer peripheral wall of the positioning post (1-2). 20
9. The rotary blade structure for the cylindrical cabinet indoor unit according to any one of claims 3 to 8, wherein an end portion of the sweep blade (2) connected with the shaft sleeve (1) is provided with a snapping collar (2-1) corresponding to the snap (1-4). 25
10. The rotary blade structure for the cylindrical cabinet indoor unit according to claim 9, wherein the snap (1-4) is snapped with the sweep blade (2) through the snapping collar (2-1). 30
11. The rotary blade structure for the cylindrical cabinet indoor unit according to any one of claims 3 to 10, wherein a plurality of round holes (3-1) are formed in a side wall of the air-duct mounting frame (3) connected with the shaft sleeve (1), and the round hole (3-1) corresponds to the positioning post (1-2). 35
12. The rotary blade structure for the cylindrical cabinet indoor unit according to claim 11, wherein the positioning post (1-2) of the shaft sleeve (1) is mounted in the round hole (3-1) and configured to rotate in the round hole (3-1). 40
13. The rotary blade structure for the cylindrical cabinet 45

indoor unit according to claim 11 or 12, wherein a difference between a diameter of the round hole (3-1) and a diameter of the positioning post (1-2) ranges from 0.2mm to 0.4mm.

14. A cylindrical cabinet indoor unit, comprising a rotary blade structure for a cylindrical cabinet indoor unit according to any one of claims 1 to 13. 50
15. The cylindrical cabinet indoor unit according to claim 14, further comprising: 55
 - an indoor unit body (4);
 - a mounting panel (5) arranged at the indoor unit body (4); and
 - an air duct assembly (6) arranged at the mounting panel (5), and comprising the rotary blade structure for the cylindrical cabinet indoor unit.

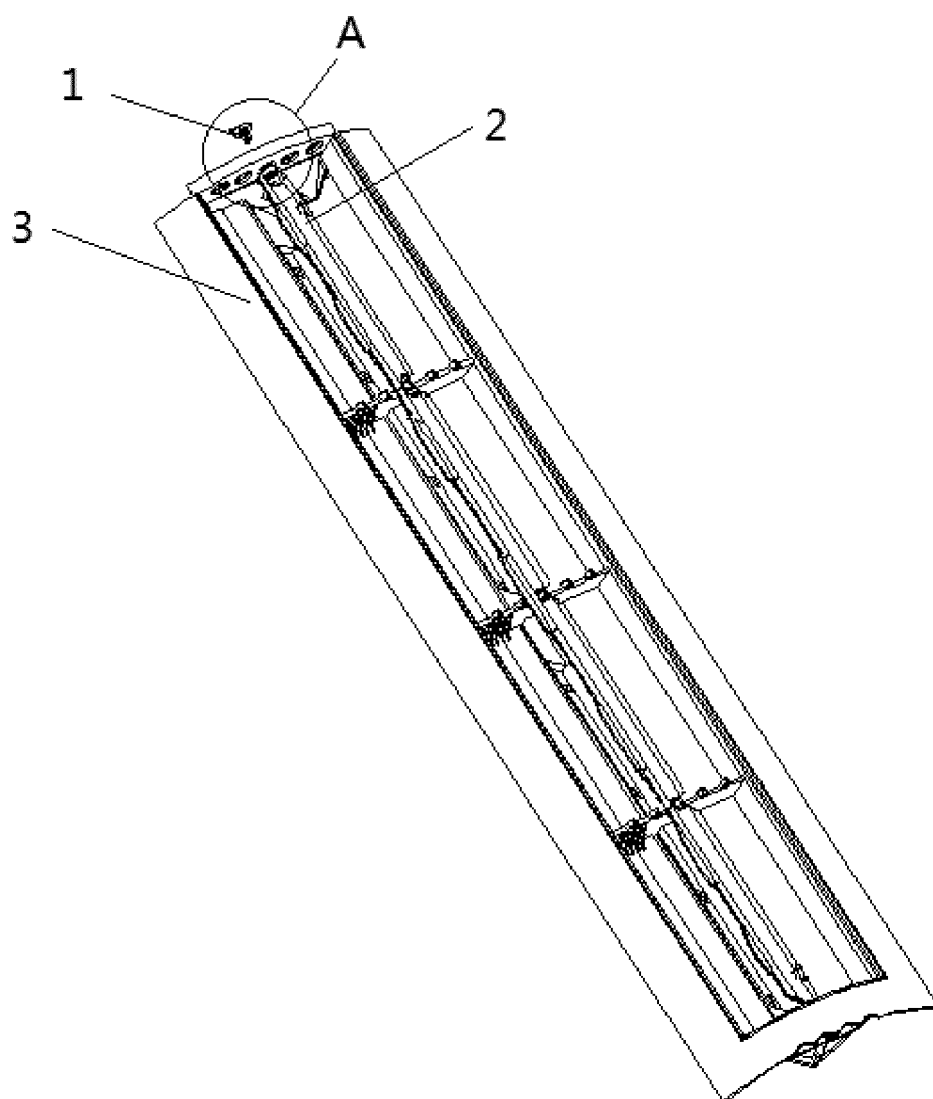


FIG. 1

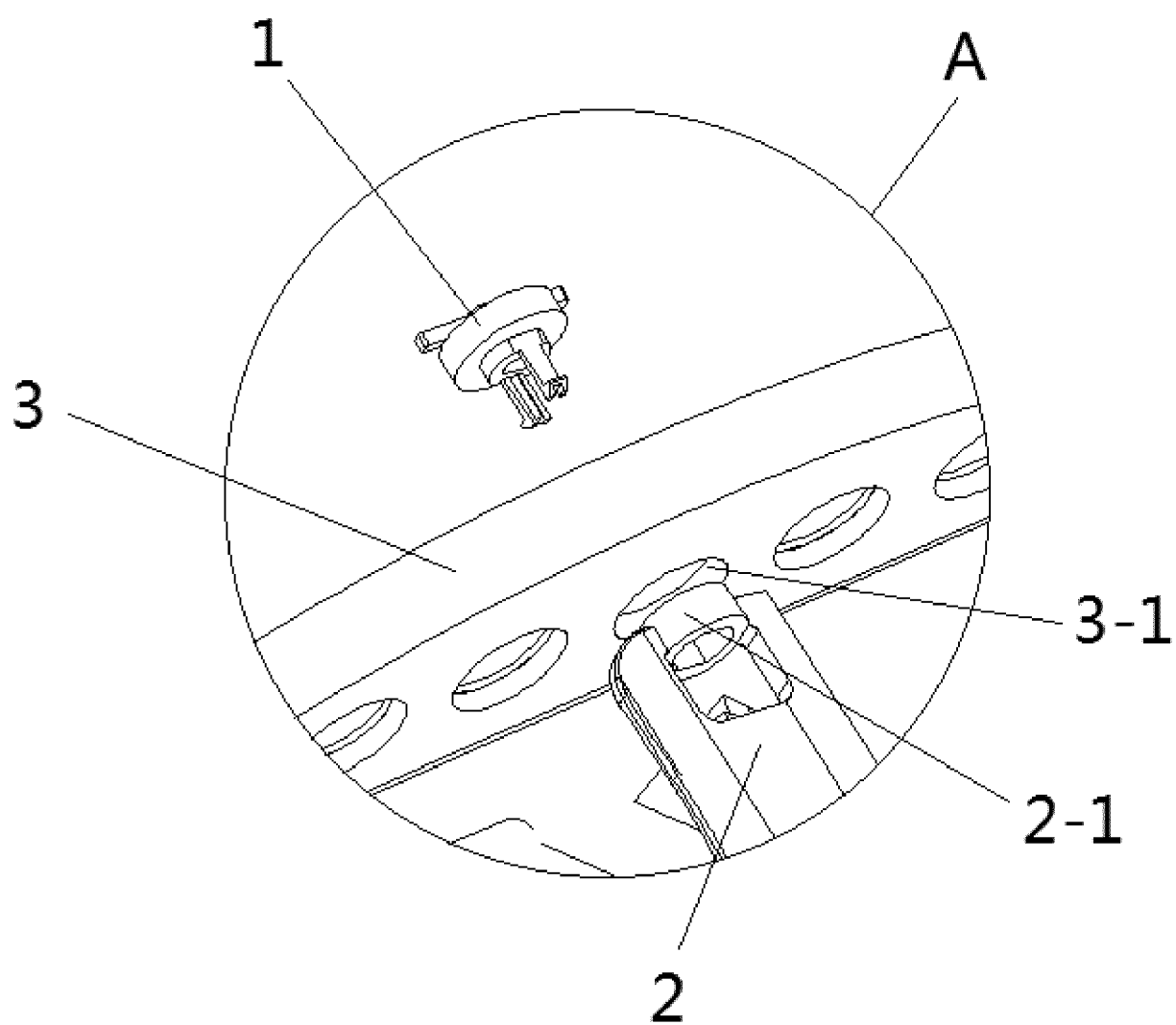


FIG. 2

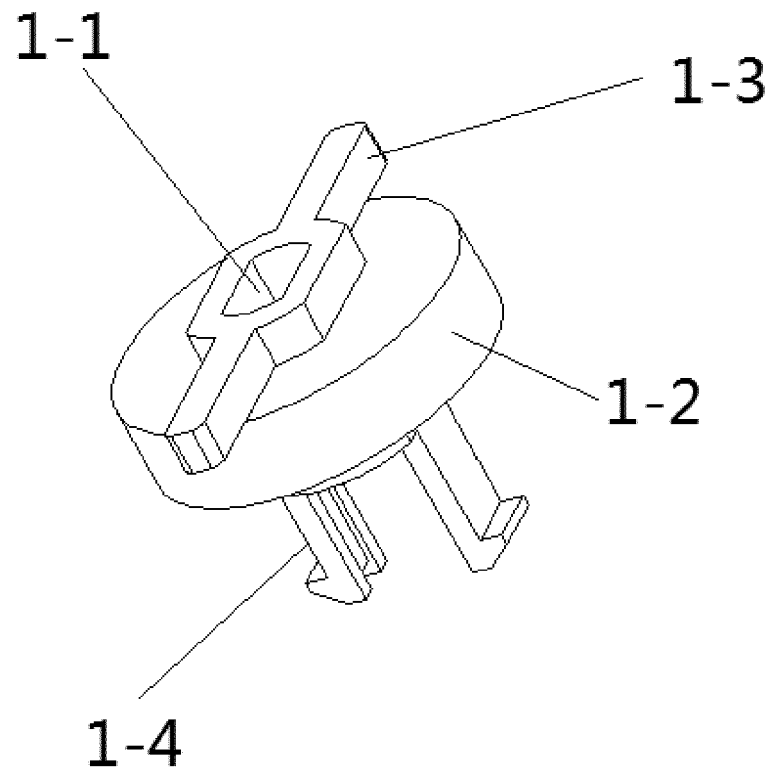


FIG. 3

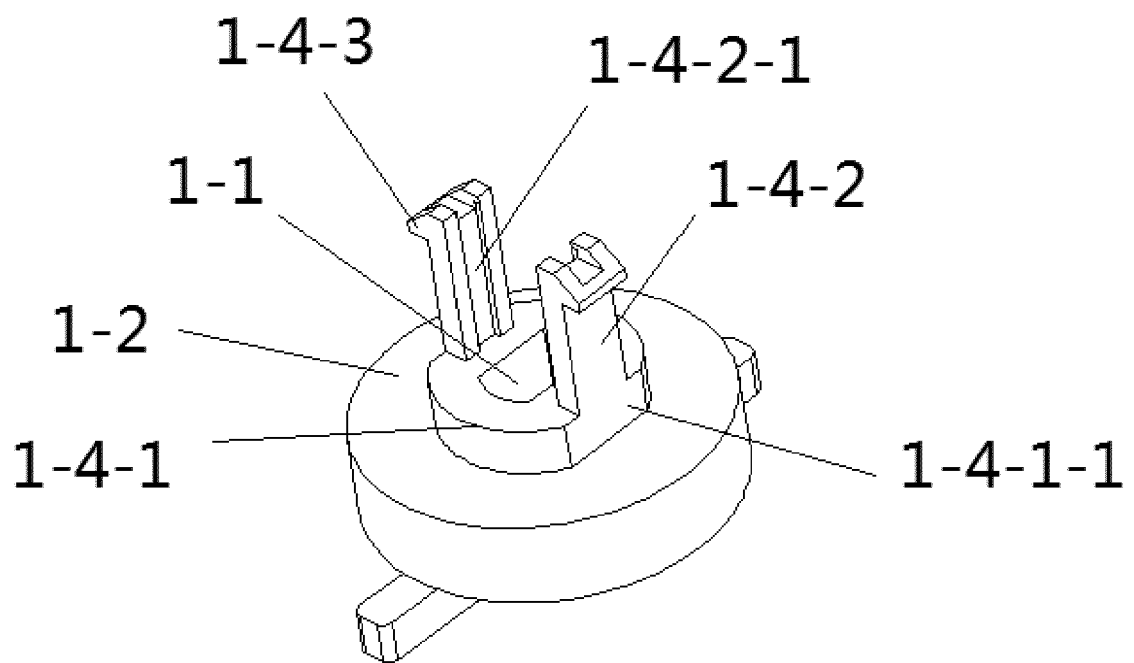


FIG. 4

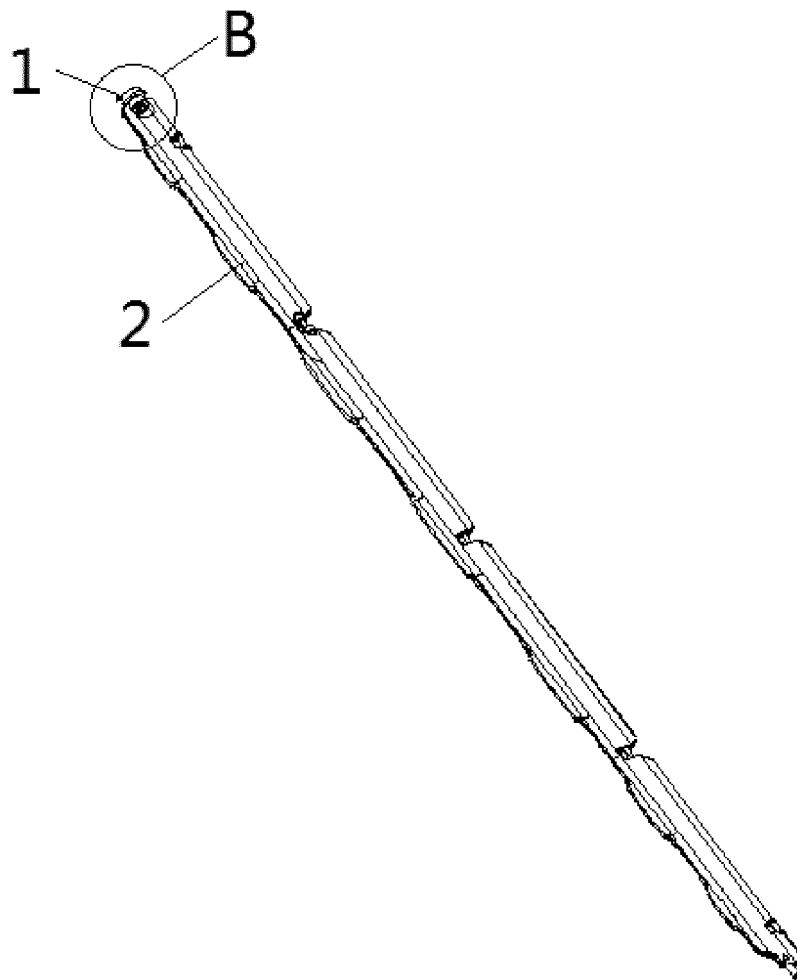


FIG. 5

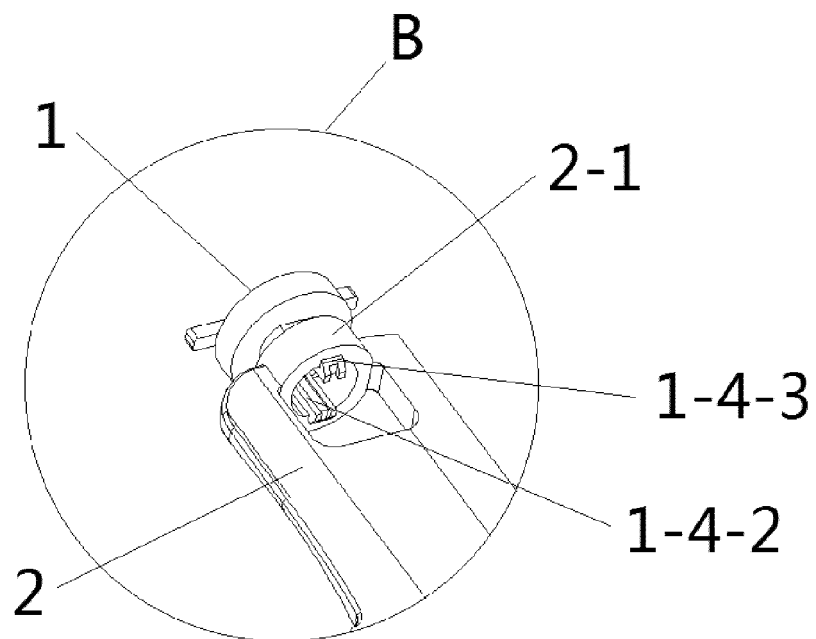


FIG. 6

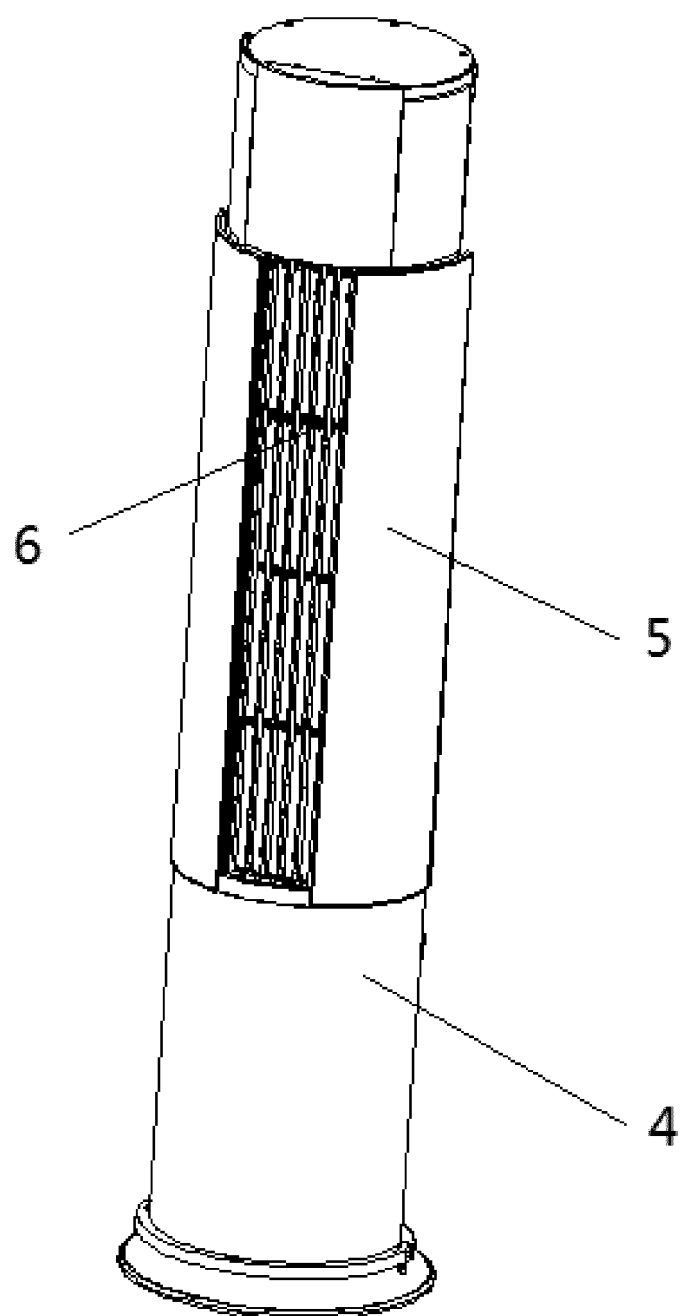


FIG. 7



EUROPEAN SEARCH REPORT

Application Number

EP 21 19 3078

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EPO FORM 1503 03.82 (P04C01)

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Place of search Munich		Date of completion of the search 1 February 2022	Examiner Blot, Pierre-Edouard
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 19 3078

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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