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(54) **SWING ASSEMBLY AND AIR CONDITIONING DEVICE**

(57) The present disclosure provides a swing assembly and an air conditioning device provided with the swing assembly. The swing assembly includes a plurality of swing blades, a link, and a mounting plate. The plurality of swing blades are parallel to an extending direction of an air outlet, spaced apart in a length direction of the mounting plate, and all connected to the link. The link is

configured to drive the swing blades to rotate around an axial direction. When the air comes from the air conditioner, the swing blade can change left and right directions of the airflow, and the air blown out from the air conditioner can have maximized coverage of the entire house and become soft to some extent, avoiding the direct blowing that makes a person feel uncomfortable.

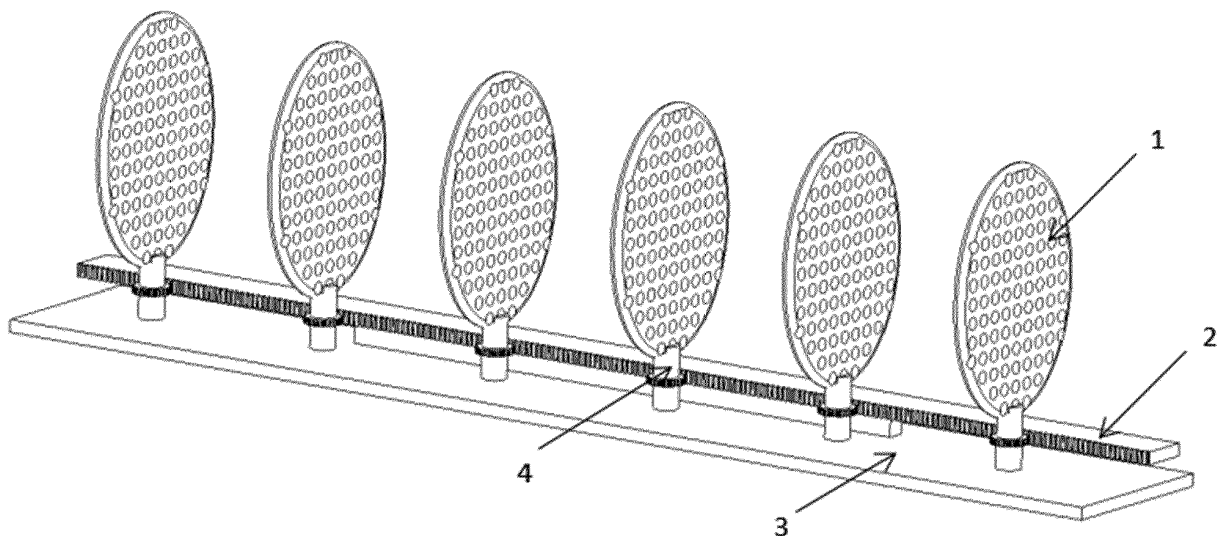


FIG. 1

Description

FIELD

[0001] The present disclosure relates to a field of air conditioners, and more particularly to a swing assembly and an air conditioning device.

BACKGROUND

[0002] Nowadays, there are more and more people using air conditioners which have almost become indispensable household appliances in people's lives. The air conditioners will be used both in cold winter and hot summer, and fans are gradually replaced. Air conditioners can blow a large amount of air. Especially in summer, when people feel very hot, once entering the room they will turn on the air conditioner with direct air-blowing on them, which will have a certain influence on people's health. If the air conditioner blows in one direction for a long time, the temperature in every corner of the room cannot meet people's needs. If the air conditioner is just mounted at a head of a bed, the blowing directly on human body while sleeping is more harmful to people's health. Therefore, it is necessary to propose a swing assembly and an air conditioning device, to solve at least a part of the problems existed in the related art.

SUMMARY

[0003] This section of the present disclosure introduces a series of simplified concepts, which will be further explained in the detailed description section. The section of the present disclosure is not intended to try to define the critical features and the essential features of the claimed technical solution, let alone to determine the protection scope of the claimed technical solution.

[0004] The present invention is defined in the independent claim 1, and the preferable features according to the present invention are defined in the dependent claims. Any embodiment in the present disclosure that does not fall within the scope of the present invention should be regarded as an example for understanding the present invention.

[0005] Compared to the related art, the present disclosure at least includes the following beneficial effects.

[0006] In the swing assembly and the air conditioning device according to the present disclosure, when the air comes from the air conditioner, the swing blade can change left and right directions of the airflow, and the air blown out from the air conditioner can maximize coverage of the entire house and can become soft to some extent, avoiding the direct blowing that makes a person feel uncomfortable.

[0007] The present invention relates to a swing assembly and an air conditioning device. Additional advantages, objectives and features of the present disclosure will be given in part in the following descriptions, and be ap-

preciated in part by a person skilled in the art from the research and practice of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The accompanying drawings are used to provide further understanding of the present disclosure, and constitutes a part of the specification, and are intended to explain the present disclosure with the following specific implementations, but do not constitute a limitation to the present disclosure. In which:

FIG. 1 is a schematic view of a first connection structure for a link and a swing blade of a swing assembly according to the present disclosure.

FIG. 2 is a side view of the structure in FIG. 1.

FIG. 3 is a schematic view of a connection structure of a swing blade and a fixing shaft in FIG. 1.

FIG. 4 is a schematic view of a fixing shaft in FIG. 1.

FIG. 5 is a schematic view of a link in FIG. 1.

FIG. 6 is a schematic view of a second connection structure for a link and a swing blade of a swing assembly according to the present disclosure.

FIG. 7 is a front view of the structure in FIG. 6.

FIG. 8 is a side view of the structure in FIG. 6.

FIG. 9 is a schematic view of a connection structure of a swing blade and a fixing shaft in FIG. 6.

FIG. 10 is a schematic view of a fixing shaft in FIG. 6.

FIG. 11 is a schematic view of a link in FIG. 6.

FIG. 12 is a schematic view of a mounting plate of a swing assembly according to the present disclosure.

DETAILED DESCRIPTION

[0009] The present invention is described in further detail below with reference to the drawings and the embodiments, to enable a person skilled in the art to implement according to the text of the specification.

[0010] It should be understood that the terms used herein, such as "have", "include" and "comprise" do not exclude existence or addition of one or more other element or combination thereof.

[0011] As illustrated in FIGS. 1 to 12, the present disclosure provides a swing assembly including a plurality of swing blades 1, a link 2, and a mounting plate 3. The plurality of swing blades 1 are parallel to an extending direction of an air outlet, spaced apart in a length direction

of the mounting plate 3, and all connected to the link 2. The link 2 is configured to drive the swing blades 1 to rotate around an axial direction.

[0012] Working principle of the above-described technical solution is: the mounting plate 3 is provided at the air outlet of the air conditioner, the swing blade 1 and the mounting plate 3 are rotatably connected, the link 2 is disposed horizontally, connected to the plurality of swing blades 1, and is able to drive the swing blades 1 to rotate, and an initial state of the swing blade 1 is that it is parallel to an extending direction of the air outlet; when the link 2 performs a straight reciprocating motion along its length direction, the plurality of swing blades 1 can be synchronously rotated about its axial direction towards two opposite directions, and the maximum angle of rotation is 90 degrees; and the motion of the link 2 can be controlled manually or electrically.

[0013] Beneficial effects of the above-described technical solution are: when the air comes from the air conditioner, the swing blade can change left and right directions of the airflow, and the air blown out from the air conditioner can have maximized coverage of the entire house and become soft to some extent, avoiding the direct blowing that makes a person feel uncomfortable.

[0014] In one embodiment, a lower end of the swing blade 1 is provided with a fixing shaft 4, and the fixing shaft 4 is provided with a linkage.

[0015] Working principle of the above-described technical solution is: the swing blade 1 and the fixing shaft 4 are detachably connected, the linkage provided on the fixing shaft 4 cooperates with the link 2, thus when the link 2 performs the straight reciprocating motion in its length direction, the linkage and the fixing shaft 4 are driven to rotate synchronously, and the swing blade 1 is driven to rotate at the same time.

[0016] Beneficial effects of the above-described technical solution are: the swing blade 1 has a detachable structure, facilitating the cleaning; and the linkage can convert the straight motion of the link 2 into the rotational motion of the fixing shaft 4.

[0017] FIGS. 1 to 5 illustrate a first technical solution for connection of the link 2 and the swing blade 1.

[0018] In one embodiment, the linkage includes a gear a, and the gear a is disposed coaxially with the fixing shaft 4.

[0019] Working principle of the above-described technical solution is: the gear a is a straight gear and can be fitted with the link 2, such that the fixing shaft 4 drives the swing blade 1 to rotate.

[0020] Beneficial effects of the above-described technical solution are: the swing blade 1 is connected to the link 2 through a gear meshing connection, which has a good transmission effect, and avoids a situation that the swing blade is stuck.

[0021] In one embodiment, a plurality of teeth b extending vertically and corresponding to the gear a is uniformly distributed on a side of the link 2 along a length direction, a slide c is provided at a lower surface of the

link 2, and the slide c is slidably connected to the mounting plate 3.

[0022] It could be understood that, the expression "a first element corresponds to a second element" used herein means that the first element is able to be fitted with the second element. For example, the plurality of teeth b correspond to the gear a, that is, the plurality of teeth b are able to be fitted with the gear a.

[0023] Working principle of the above-described technical solution is: the link 2 is provided with the tooth b meshing with the gear a, when the link 2 moves in its length direction, the plurality of teeth b define a motion path of the gear a, and the gear a drives the swing blade 1 to rotate; the slide c is provided at the lower surface of the link 2, a sliding slot (not illustrated) is correspondingly defined in the mounting plate 3, the sliding slot has a length greater than a length of the slide c, and the link 2 can move linearly along the sliding slot through the slide c without coming out.

[0024] Beneficial effects of the above-described technical solution are: the gear meshing has a good transmission effect, and can make rotation of the swing blade smooth; the cooperation of the slide c and the sliding slot enables the link 2 to perform the straight motion stably.

[0025] FIGS. 6 to 12 illustrate a second technical solution for connection of the link 2 and the swing blade 1.

[0026] In one embodiment, the linkage comprises a connecting rod 5 and a rotary shaft 6. The connecting rod 5 is disposed horizontally, and has a first end connected to the fixing shaft 4 and a second end connected to the rotary shaft 6 disposed vertically.

[0027] Working principle of the above-described technical solution is: the fixing shaft 4 and the first end of the connecting rod 5 are connected into one piece, and the rotary shaft 6 provided at the second end of the connecting rod 5 can be rotatably connected to the link 2.

[0028] Beneficial effects of the above-described technical solution are: the connection method of the swing blade 1 and the link 2 is simple, thereby achieving the same effect as the first technical solution for connection of the link 2 and the swing blade 1.

[0029] In one embodiment, a plurality of connection holes d corresponding to the rotary shaft 6 is uniformly disposed in the link 2.

[0030] Working principle of the above-described technical solution is: the connection hole d in the link 2 can allow the rotary shaft 6 to be inserted and snap-fitted therein, without coming out easily; moreover, the rotary shaft 6 is rotatable in the connection hole d, when the link 2 moves in its length direction, the rotary shaft 6 moves with it and drives the connecting rod 5 and the fixing shaft 4 to rotate, to change the direction of the swing blade 1.

[0031] Beneficial effects of the above-described technical solution are: the connection method of the rotary shaft 6 and the link 2 is simple, and they can be connected only by an external force; the rotary shaft 6 and the link 2 move together to change the direction of the swing

blade 1.

[0032] In one embodiment, a lower end of the fixing shaft 4 is provided with a connection portion 4-1 corresponding to a mounting hole 3-1 in the mounting plate 3, and the fixing shaft 4 and the mounting plate 3 are rotatably connected.

[0033] Working principle of the above-described technical solution is: a plurality of mounting holes 3-1 are uniformly distributed in the mounting plate 3 along its length direction, and the mounting hole 3-1 can allow the connection portion 4-1 to be inserted and snap-fitted therein; moreover, the connection portion 4-1 is rotatable in the mounting hole 3-1, and when the link 2 drives the swing blade 1 to rotate, the swing blade 1 will rotate by a certain angle about its axial direction through the connection portion 4-1.

[0034] Beneficial effects of the above-described technical solution are: the connection portion 4-1 of the fixing shaft 4 can fix the swing blade 1 to the mounting plate 3 at the air outlet, and can make the swing blade 1 rotate about its axial direction, and the structure is simple.

[0035] In one embodiment, the swing blade 1 is provided with a plurality of vent holes 1-1 therein, and a shape of the vent hole 1-1 is a circle having a diameter less than or equal to 3mm.

[0036] Working principle of the above-described technical solution is: the swing blade 1 is provided with the plurality of vent holes 1-1 to allow the air blown from the air conditioner to pass through, and to reduce vibration of the swing blade generated by the airflow during rotation of the swing blade; the vent hole 1-1 is configured as a circle having a diameter less than or equal to 3mm, helping to reduce the intensity of the airflow.

[0037] Beneficial effects of the above-described technical solution are: after the swing blade 1 is rotated by 90 degrees, it is perpendicular to the extending direction of the air outlet, in which case the blown-out air can pass through the vent hole 1-1, the intensity of the airflow reaching the room is reduced to some extent, and the air blown to the human body is softer; meanwhile, when the swing blade 1 is swinging, the vent hole 1-1 can also reduce the vibration and noise of the swing blade due to excessive airflow.

[0038] In one embodiment, the swing assembly further includes a drive device disposed at an end of the link 2 and is configured to control the link 2 to perform a straight reciprocating motion.

[0039] Working principle of the above-described technical solution is: the drive device (not illustrated) can control the distance of the straight reciprocating motion of the link 2, and make it stop at any position, to achieve the purpose of arbitrary adjustment of the rotation angle of the swing blade 1 within a certain range.

[0040] Beneficial effects of the above-described technical solution are: it is convenient to control the motion of the link 2 by the drive device, the manual adjustment is omitted, and a remote control of the air conditioner can be used to control the rotation direction of the swing blade

1.

[0041] In one embodiment, an upper end of the fixing shaft 4 is provided with a groove 4-2 corresponding to the lower end of the swing blade 1.

[0042] Working principle of the above-described technical solution is: the lower end of the swing blade 1 can be snap-fitted into the groove 4-2 in the fixing shaft 4.

[0043] Beneficial effects of the above-described technical solution are: the connection is firm, and is detachable only by an external force, and the cleaning is convenient.

[0044] In one embodiment, a shape of the swing blade 1 is polygonal or oval.

[0045] Working principle of the above-described technical solution is: the shape of the swing blade 1 can be determined according to practical requirements; after the plurality of swing blades 1 are rotated by 90 degrees, the spacing between each swing blade 1 is small, which can make the blown-out air softer.

[0046] Beneficial effects of the above-described technical solution are: the swing blades 1 after being rotated by 90 degrees are located in the same plane, the small spacing therebetween can retard an amount of the blown-out air, the airflow becomes much softer, and the direct blowing on the human body is avoided, which is more suitable for the elderly and the children.

[0047] The present disclosure also provides an air conditioning device. The air conditioning device is provided with an air outlet, and a swing assembly according to the present disclosure. The swing assembly is provided at the air outlet, and the plurality of blades of the swing assembly are parallel to an extending direction of the air outlet.

[0048] Working principle of the above-described technical solution is: the swing assembly is provided at the air outlet of the air conditioning device, and can change the direction of the swing blade 1 to change the direction of the airflow at the air outlet; when all of the swing blades 1 are rotated into the same plane, the airflow at the air outlet is mostly blown out through the plurality of vent holes 1-1, such that the airflow is broken up, and the speed of the airflow is reduced.

[0049] Beneficial effects of the above-described technical solution are: the swing assembly is provided at the air outlet of the air conditioning device, can effectively change the direction of the airflow, and can break up a large amount of the airflow at the air outlet, to retard the blown-out air and make the airflow much softer.

[0050] In the specification, it is to 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," "counterclockwise," "axial," "radial" and "circumferential" should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present disclosure be constructed or operated in a particular ori-

entation.

[0051] In the present disclosure, unless specified or limited otherwise, the terms "mounted," "connected," "coupled," "fixed" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integral connections; may also be mechanical or electrical connections; may also be direct connections or indirect connections via intervening structures; may also be inner communications of two elements, unless limited otherwise. Those having ordinary skills in the art should understand the specific meanings in the present disclosure according to specific situations.

[0052] Although implementations of the present invention are disclosed as above, but are not merely limited to applications listed in the specification and the embodiments, and they are absolutely applicable to various fields suitable for the present invention. For a person skilled in the art, additional modifications can be readily achieved, therefore, the present disclosure is not limited to the specified details and the drawings illustrated and described herein, without departing from the general concepts defined by the claims and their equivalent scope.

Claims

1. A swing assembly, comprising:

a plurality of swing blades (1) parallel to each other,
a link (2), and
a mounting plate (3),
wherein the plurality of swing blades (1) are spaced apart in a length direction of the mounting plate (3), and all connected to the link (2), the link (2) is configured to drive the swing blades (1) to rotate around an axial direction.

2. The swing assembly according to claim 1, wherein a lower end of the swing blade (1) is provided with a fixing shaft (4), and the fixing shaft (4) is provided with a linkage.

3. The swing assembly according to claim 2, wherein the linkage comprises a gear (a) disposed coaxially with the fixing shaft (4).

4. The swing assembly according to claim 3, wherein the gear (a) is a straight gear.

5. The swing assembly according to claim 3 or 4, wherein a plurality of teeth (b) extending vertically and corresponding to the gear (a) is uniformly distributed on a side of the link (2) along a length direction, a slide (c) is provided at a lower surface of the link (2), and the slide (c) is slidably connected to the mounting plate (3).

6. The swing assembly according to claim 5, wherein the mounting plate (3) defines a sliding slot corresponding to the slide (c) therein, and the link (2) is movable along the sliding slot through the slide (c).

7. The swing assembly according to any one of claims 2 to 6, wherein the linkage comprises a connecting rod (5) and a rotary shaft (6), and the connecting rod (5) is disposed horizontally, and has a first end connected to the fixing shaft (4) and a second end connected to the rotary shaft (6) disposed vertically.

8. The swing assembly according to claim 7, wherein the fixing shaft (4) and the first end of the connecting rod (5) are connected into one piece, and the rotary shaft (6) is rotatably connected to the link (2).

9. The swing assembly according to claim 7 or 8, wherein a plurality of connection holes (d) corresponding to the rotary shaft (6) is uniformly disposed in the link (2).

10. The swing assembly according to any one of claims 2 to 9, wherein a lower end of the fixing shaft (4) is provided with a connection portion (4-1) corresponding to a mounting hole (3-1) in the mounting plate (3), and the fixing shaft (4) and the mounting plate (3) are rotatably connected.

11. The swing assembly according to any one of claims 1 to 10, wherein the swing blade (1) is provided with a plurality of vent holes (1-1) therein, and a shape of the vent hole (1-1) is a circle having a diameter less than or equal to 3mm.

12. The swing assembly according to any one of claims 1 to 11, further comprising a drive device disposed at an end of the link (2) and configured to control the link (2) to perform a straight reciprocating motion.

13. The swing assembly according to any one of claims 2 to 12, wherein an upper end of the fixing shaft (4) is provided with a groove (4-2) corresponding to the lower end of the swing blade (1).

14. The swing assembly according to any one of claims 1 to 13, wherein a shape of the swing blade (1) is polygonal or oval.

15. An air conditioning device, comprising:

an air outlet, and

a swing assembly according to any one of claims 1 to 14, the swing assembly being provided at the air outlet, and the plurality of blades of the swing assembly being parallel to an extending direction of the air outlet.

Amended claims in accordance with Rule 137(2) EPC.

in the link (2).

1. A swing assembly, comprising:

a plurality of swing blades (1) parallel to each other,
a link (2), and
a mounting plate (3),
wherein the plurality of swing blades (1) are spaced apart in a length direction of the mounting plate (3), and all connected to the link (2), the link (2) is configured to drive the swing blades (1) to rotate around an axial direction, and wherein a lower end of the swing blade (1) is provided with a fixing shaft (4), and the fixing shaft (4) is provided with a linkage,
characterized in that an upper end of the fixing shaft (4) is provided with a groove (4-2) corresponding to the lower end of the swing blade (1), and the lower end of the swing blade (1) is snap-fitted into the groove (4-2) in the fixing shaft (4).

2. The swing assembly according to claim 1, wherein the linkage comprises a gear (a) disposed coaxially with the fixing shaft (4).

3. The swing assembly according to claim 2, wherein the gear (a) is a straight gear.

4. The swing assembly according to claim 2 or 3, wherein a plurality of teeth (b) extending vertically and corresponding to the gear (a) is uniformly distributed on a side of the link (2) along a length direction, a slide (c) is provided at a lower surface of the link (2), and the slide (c) is slidably connected to the mounting plate (3).

5. The swing assembly according to claim 4, wherein the mounting plate (3) defines a sliding slot corresponding to the slide (c) therein, and the link (2) is movable along the sliding slot through the slide (c).

6. The swing assembly according to any one of claims 1 to 5, wherein the linkage comprises a connecting rod (5) and a rotary shaft (6), and the connecting rod (5) is disposed horizontally, and has a first end connected to the fixing shaft (4) and a second end connected to the rotary shaft (6) disposed vertically.

7. The swing assembly according to claim 6, wherein the fixing shaft (4) and the first end of the connecting rod (5) are connected into one piece, and the rotary shaft (6) is rotatably connected to the link (2).

8. The swing assembly according to claim 6 or 7, wherein a plurality of connection holes (d) corresponding to the rotary shaft (6) is uniformly disposed

9. The swing assembly according to any one of claims 1 to 8, wherein a lower end of the fixing shaft (4) is provided with a connection portion (4-1) corresponding to a mounting hole (3-1) in the mounting plate (3), and the fixing shaft (4) and the mounting plate (3) are rotatably connected.

10. The swing assembly according to any one of claims 1 to 9, wherein the swing blade (1) is provided with a plurality of vent holes (1-1) therein, and a shape of the vent hole (1-1) is a circle having a diameter less than or equal to 3mm.

11. The swing assembly according to any one of claims 1 to 10, further comprising a drive device disposed at an end of the link (2) and configured to control the link (2) to perform a straight reciprocating motion.

12. The swing assembly according to any one of claims 1 to 11, wherein a shape of the swing blade (1) is oval.

13. An air conditioning device, comprising:

an air outlet, and
a swing assembly according to any one of claims 1 to 12, the swing assembly being provided at the air outlet, and the plurality of blades of the swing assembly being parallel to an extending direction of the air outlet.

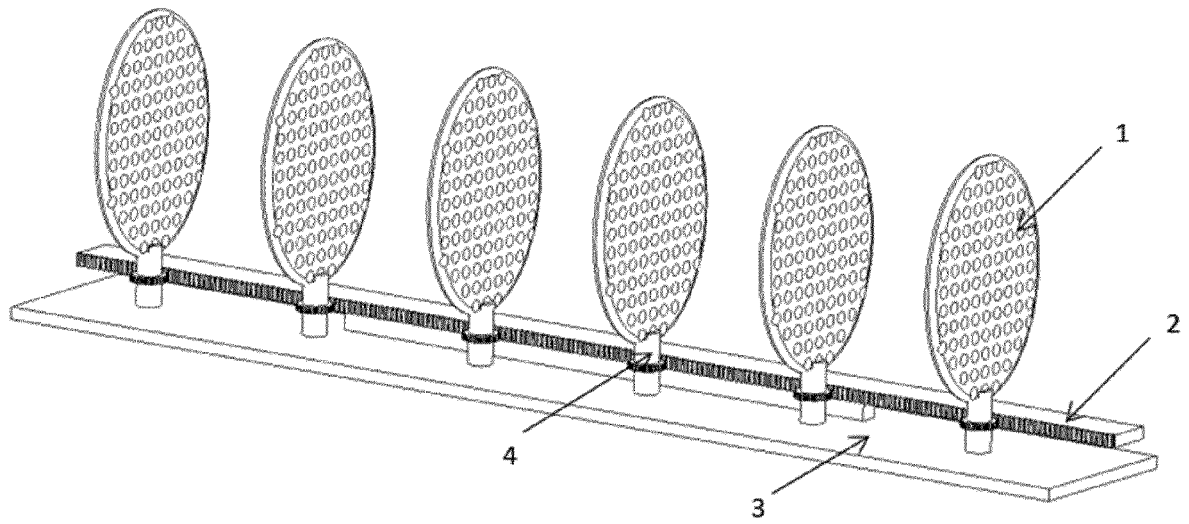


FIG. 1

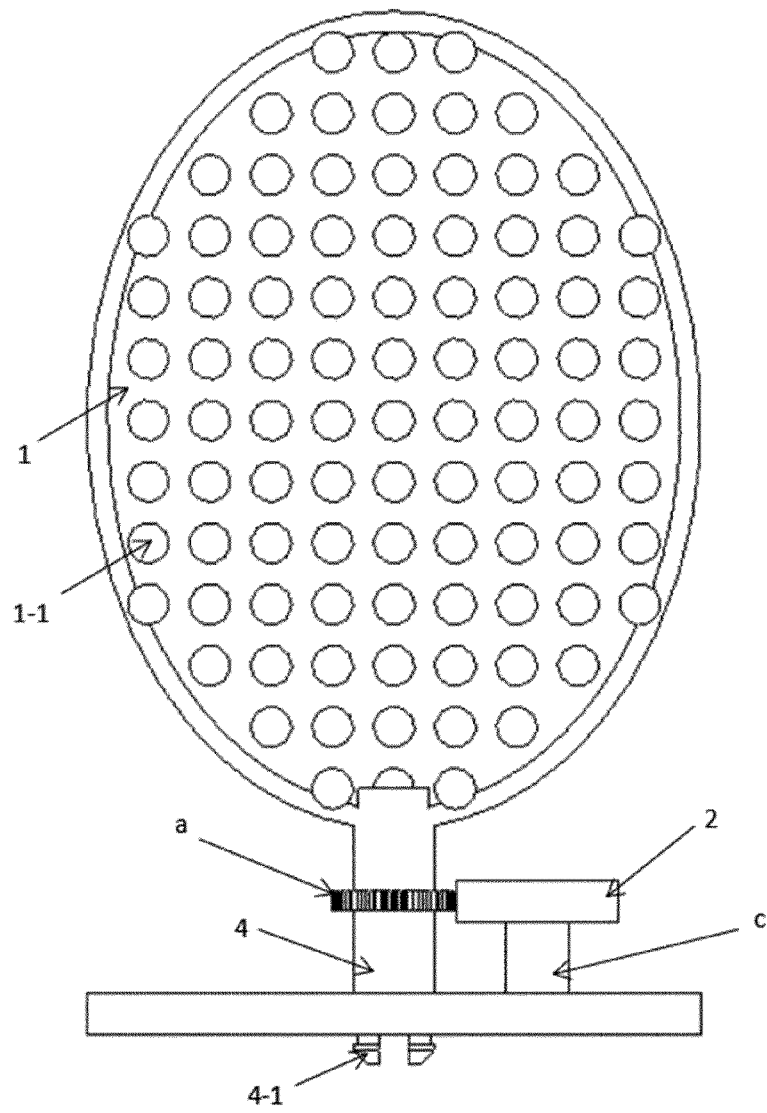


FIG. 2

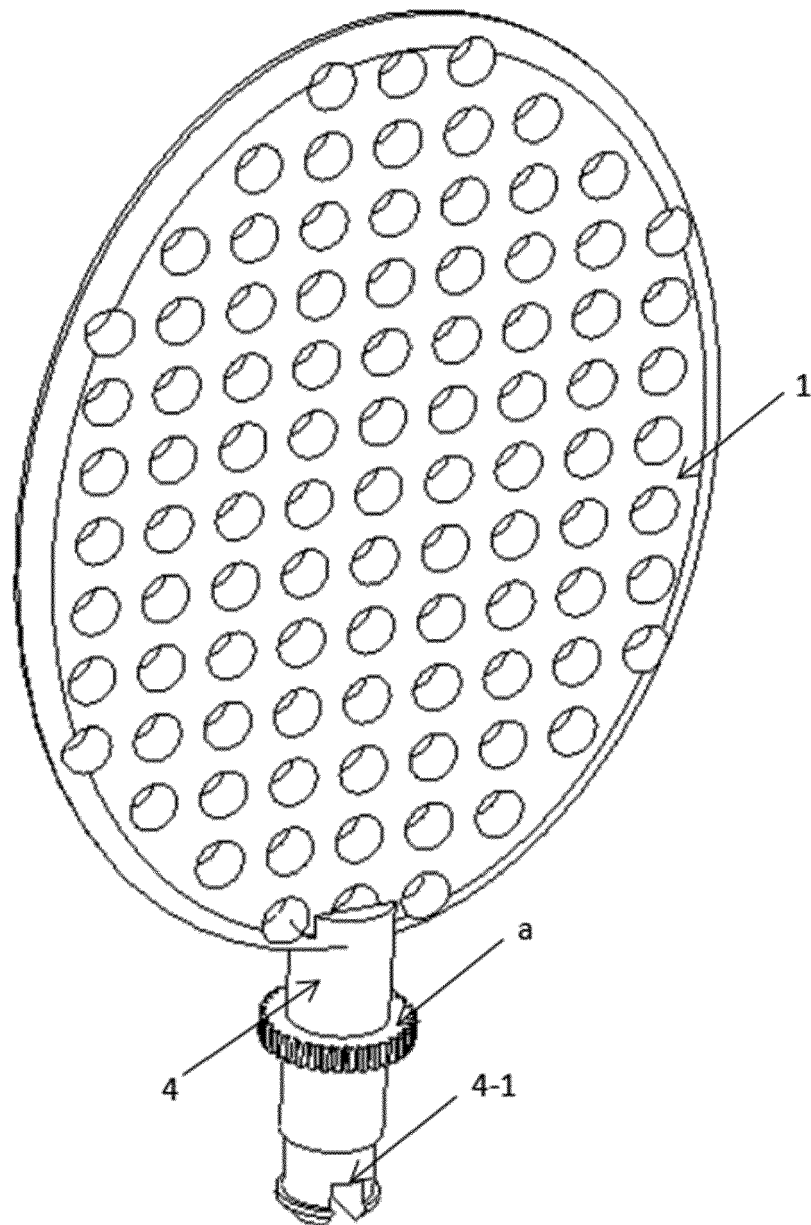


FIG. 3

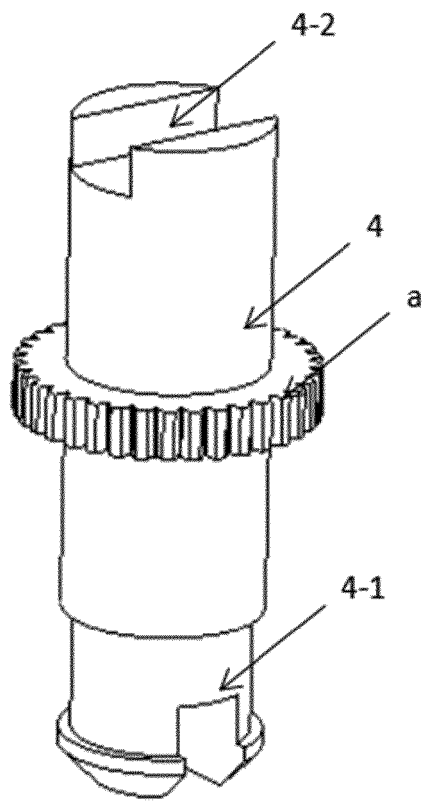


FIG. 4

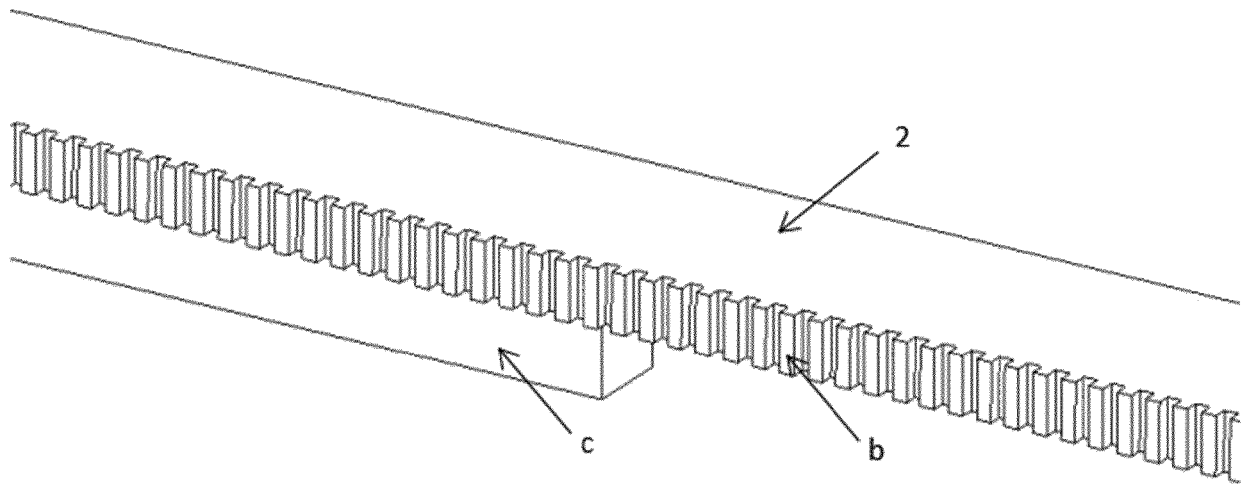


FIG. 5

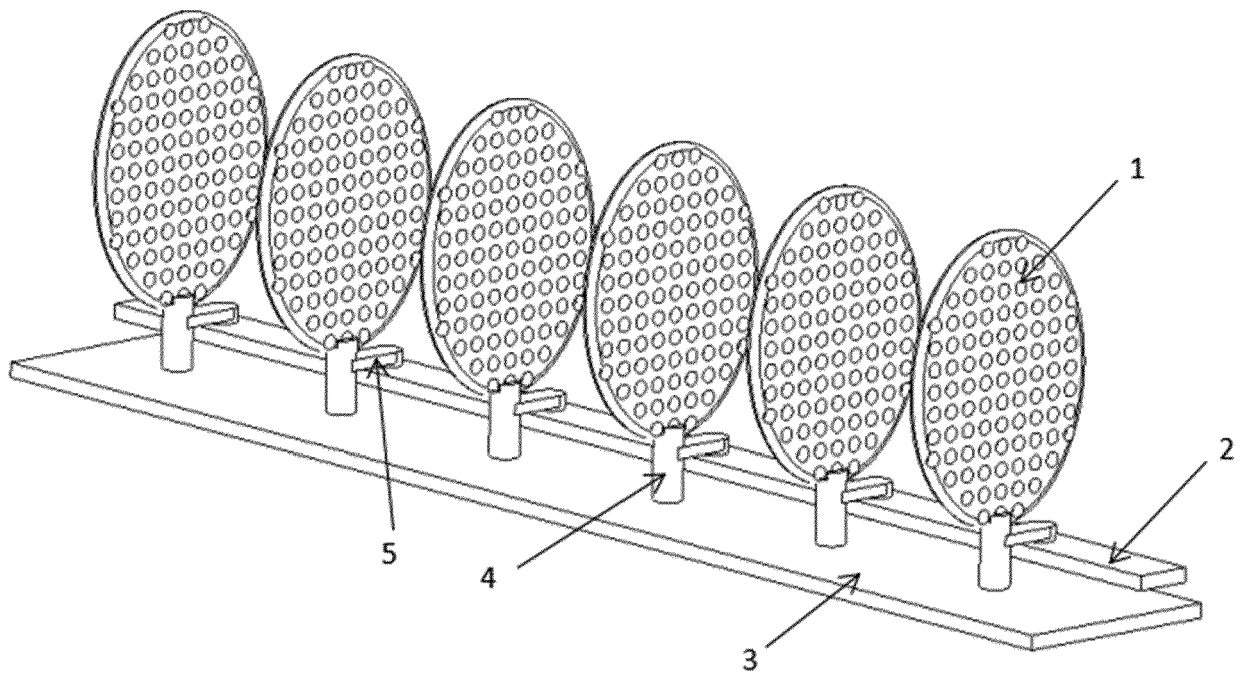


FIG. 6

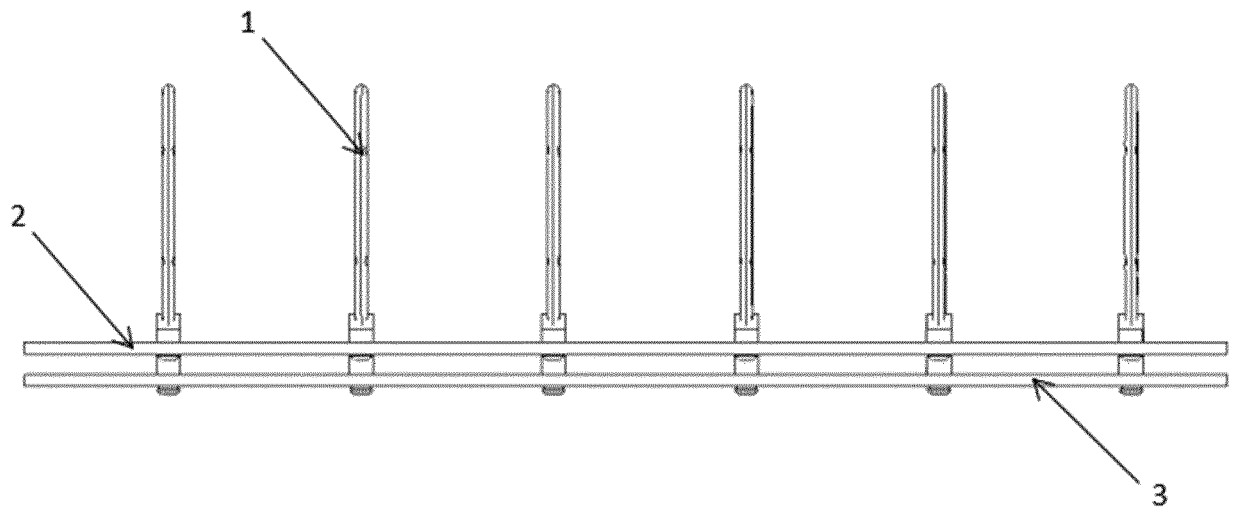


FIG. 7

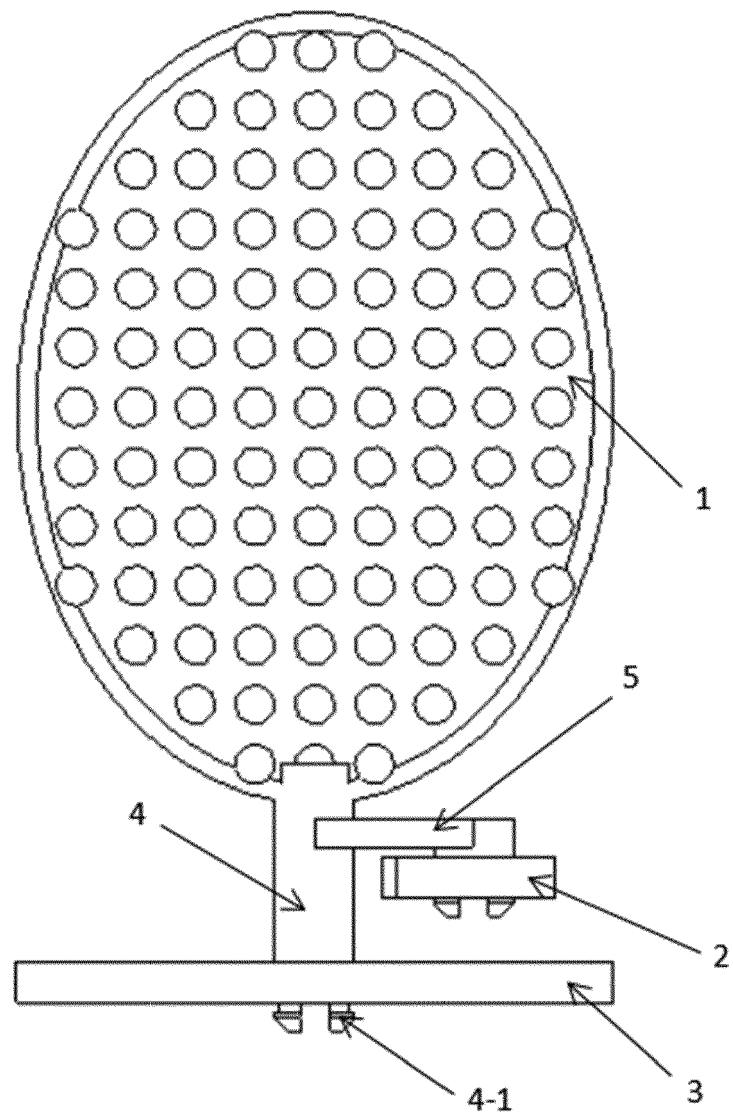


FIG. 8

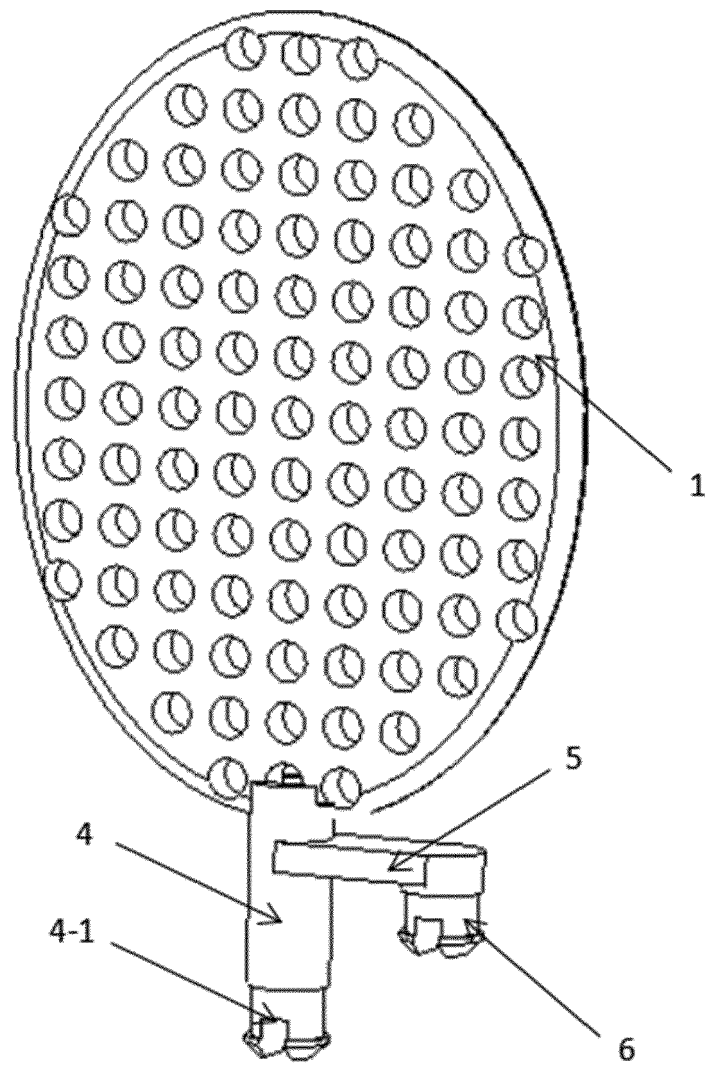


FIG. 9

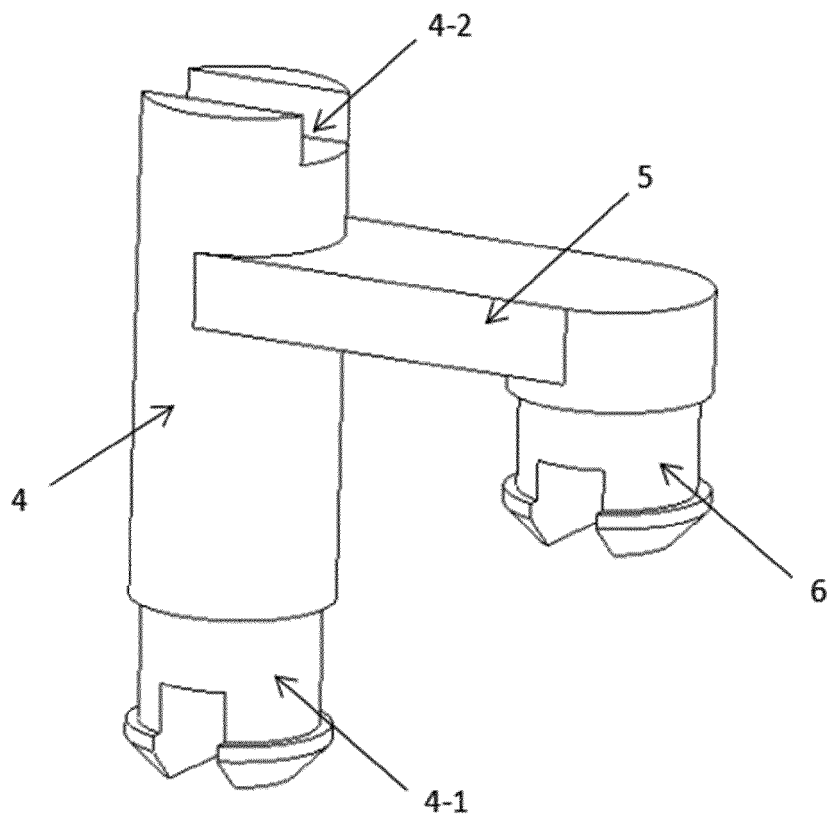


FIG. 10

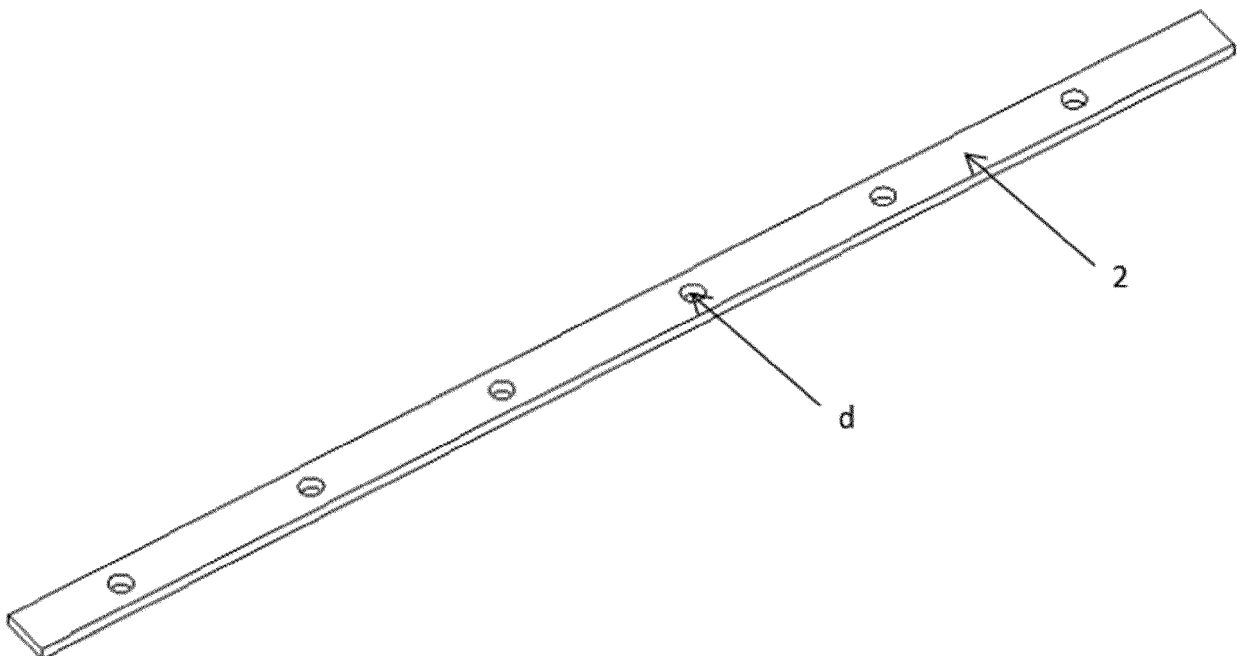


FIG. 11

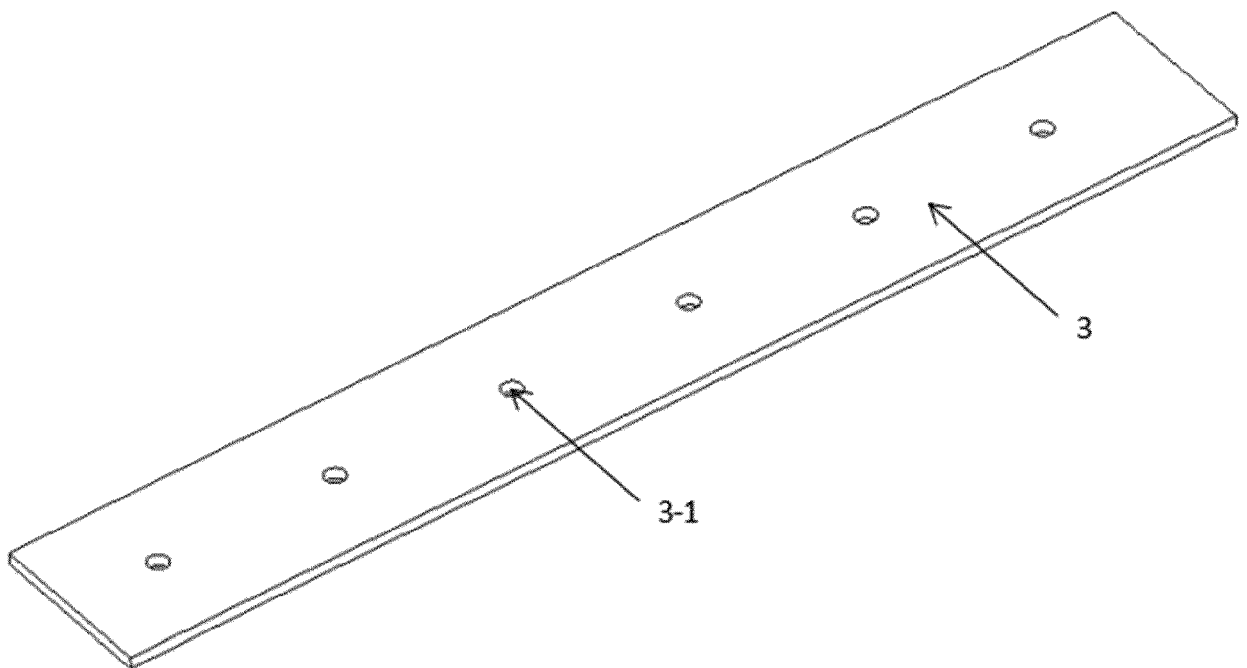


FIG. 12



EUROPEAN SEARCH REPORT

 Application Number
 EP 20 20 2531

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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	* paragraph [0006] - paragraph [0025] *		
	* figures *		

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	* paragraph [0080] - paragraph [0082] *		
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	* figures 1-6,13 *		

The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 March 2021	Examiner Mattias Grenbäck
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	

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 EPO FORM 1503 03.82 (P04C01)

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

EP 20 20 2531

5 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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25-03-2021

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