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(54) ATOMIZATION CORE HAVING AIRFLOW BIN

(57) The present invention provides an atomizing core which includes a heating unit, and a liquid transfer unit made of a porous material and configured for absorbing and transferring liquid. The liquid transfer unit includes an air guide part, and a base connected to and surrounding the air guide part. A gap between the air guide part and the base forms an air flow chamber. The liquid transfer unit is provided with an air inlet communicated with the air flow chamber, an air outlet communicated with the air flow chamber, and a liquid inlet part for contacting with the liquid. The heating unit includes a heating part which generates heat when energized, and electrical connection parts for transmitting currents to the heating part. The heating part is disposed on an inner wall of the air flow chamber and in contact with the liquid transfer unit. Due to the fact that the air flow chamber of the atomizing core is disposed in the liquid transfer unit made of a porous material and the heating part of the heating unit are disposed in the air flow chamber, the volume, flow rate and path of the air flow are determined mainly by the structure of the liquid transfer unit and not affected by other parts and the assembly relation of parts, so the consistency of the atomization effect is guaranteed.

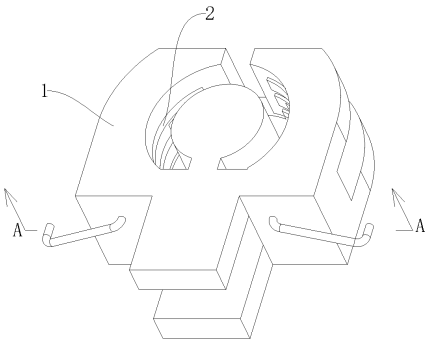

FIG. 1

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Description

FIELD

[0001] The invention relates to the technical field of atomization, in particular to an atomizing core with an air flow chamber.

BACKGROUND

[0002] The atomizing core, as the key part of atomizers, typically comprises a liquid transfer unit and a heating unit, wherein the liquid transfer unit is mainly used for transferring liquid onto the heating unit, such that the liquid can be heated and atomized by the heating unit; and when applied to an atomizer for e-cigarettes, the atomizing core is mainly used for transferring, heating and evaporating e-liquid.

[0003] In prior art, when the atomizing core and other parts are assembled to form an atomizer, an atomization chamber and an air inlet and an air outlet of the atomization chamber are defined by the atomizing core and other parts. A heating part of the heating unit heats liquid to generate smoke, which is then taken away by an air flow. Due to the fact that the atomization chamber and the air inlet and the air outlet of the atomization chamber are defined by the atomizing core and other parts, the air flow entering the atomization chamber and the air inlet and the air outlet has an influence on the atomization effect, and the volume and flow rate of the air flow also have an indirect influence on the atomization effect and stability, so if the assembly precision or consistency of the atomizing core and other parts is not good, the atomization effect of the atomizing core will be compromised.

SUMMARY

[0004] The technical issue to be solved by the invention is to provide an improved atomizing core with an air flow chamber to overcome the abovementioned defects in the prior art.

[0005] The technical solution adopted by the invention to solve the above technical issue is to provide an atomizing core which comprises a heating unit, and a liquid transfer unit made of a porous material and configured for absorbing and transferring liquid. The liquid transfer unit comprises an air guide part, and a base which is connected to and surrounds the air guide part, a gap between the air guide part and the base forms an air flow chamber. The liquid transfer unit is provided with an air inlet communicated with the air flow chamber, an air outlet communicated with the air flow chamber, and a liquid inlet part to be in contact with the liquid. The heating unit comprises a heating part which generates heat when energized, and electrical connection parts configured for transmitting currents to the heating part. The heating part are disposed on an inner wall of the air flow chamber and are in contact with the liquid transfer unit, such that when the liquid inlet part of the liquid transfer unit contacts the liquid, the liquid is transferred by the liquid transfer unit onto the heating part to be heated to generate smoke, and an external air flow enters the air flow chamber through the air inlet and takes the smoke out through the air outlet.

[0006] Preferably, the air flow chamber is an annular ring space, or a ring space with angles.

[0007] Preferably, the base comprises a first part and a second part, the first part and the second part surround two sides of the air guide part respectively, and one end of the first part and one end of the second part are joined together and are connected to the air guide part.

[0008] Preferably, in the air flow chamber, the heating part are disposed on the base, and the liquid inlet part is disposed on an outer side of the base.

[0009] Preferably, the air inlet part is a liquid inlet recess formed in the outer side of the base.

[0010] Preferably, in the air flow chamber, the heating part are disposed on the air guide part.

[0011] Preferably, the liquid inlet part is a liquid inlet recess formed in an outer side of the air guide part.

[0012] Preferably, the air inlet is formed in a joint of the base and the air guide part.

[0013] Preferably, the other end of the first part and the other end of the second part define the air outlet therebetween.

[0014] Preferably, the air inlet is disposed at a lower side of the liquid transfer unit, and the liquid transfer unit comprises a support part which is connected to the base and/or the air guide part, protrudes downwards and is used for elevating the air inlet.

[0015] By adopting the technical solution, the invention has at least the following beneficial effects: due to the fact that the air flow chamber of the atomizing core is disposed in the liquid transfer unit made of a porous material and the heating part of the heating unit are disposed in the air flow chamber, the volume, flow rate and path of the air flow are determined mainly by the structure of the liquid transfer unit and is not affected by other parts and the assembly relation of parts, so the consistency of the atomization effect is guaranteed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] To more clearly explain the technical solutions of the embodiments of the invention, drawings used for describing the embodiments of the invention or the prior art will be briefly introduced below. Obviously, the drawings in the following description merely illustrate some embodiments of the invention, and those ordinarily skilled in the art can obtain other drawings according to the following ones without creative labor.

FIG. 1 is a perspective view of an atomizing core according to one embodiment of the invention.

FIG. 2 is a sectional view taken along line A-A in FIG.

1.

FIG. 3 is a perspective view of a heating unit of the atomizing core in FIG. 1.

FIG. 4 is a perspective view of a liquid transfer unit of the atomizing core in FIG. 1.

FIG. 5 is a perspective view of a liquid transfer unit of an atomizing core according to another embodiment of the invention.

FIG. 6 is a perspective view of an atomizing core according to another embodiment of the invention.

FIG. 7 is a sectional view taken along line B-B in FIG. 6.

FIG. 8 is a perspective view of a heating unit of the atomizing core in FIG. 6.

FIG. 9 is a perspective view of a liquid transfer unit of the atomizing core in FIG. 6.

[0017] Reference signs: 1, liquid transfer unit; 11, base; 111, first part; 112, second part; 12, air guide part; 13, support part; 14, liquid inlet part; 15, air inlet; 16, air outlet; 17, air flow chamber; 2, heating unit; 21, heating part; 22, electrical connection part.

DESCRIPTION OF THE EMBODIMENTS

[0018] For a better understanding of the technical features, purposes and effects of the invention, the specific implementations of the invention are described in detail with reference to the accompanying drawings. It should be understood that terms such as "upper", "lower", "longitudinal", "cross", "top", "bottom", "inner" and "outer" are used to indicate directional or positional relations, and configuration and operation in specific directions based on the accompanying drawings merely for the purpose of facilitating the description of the technical solution of the invention, and do not indicate that devices or elements referred to must be in a specific direction, so they should not be construed as limitations of the technical solution of the invention. It should be noted that, unless otherwise expressly stated and defined, terms such as "mount", "link", "connect", and "dispose" in the specification should be broadly understood. For example, "connect" may refer to fixed connection, detachable connection or integrated connection; or, direct connection, indirect connection through an intermediate medium, or internal connection or interaction of two elements. When one element is referred to as being "over" or "under" the other element, it may be "directly" or "indirectly" located on the other element, or one or more intermediate elements may exist between these two elements. Terms such as "first", "second" and "third" in the specification are merely for the purpose of conveniently describing the technical solution of the invention, and should not be construed as indicating or implying relative importance or implicitly indicating the number of technical features referred to. So, when one feature is defined by the terms such as "first", "second" and "third", it may explicitly or implicitly indicate the inclusion of one or more said features. Those ordinarily skilled in the art can understand the specific meanings of these terms in the invention as the case may be.

[0019] To gain a thorough understanding of the embodiments of the invention, specific details such as system structures and techniques are given below for the purpose of description rather than restriction. It is obvious for those skilled in the art that the invention can also be implemented in other embodiments without these specific details. In other cases, a detailed description of commonly known systems, devices, circuits and methods is omitted to ensure that the invention can be described without being interfered by unnecessary details.

[0020] Referring to FIG. 1-FIG. 4, an atomizing core in accordance with an embodiment of the invention comprises a heating unit 2, and a liquid transfer unit 1 which is configured for absorbing and transferring liquid and is made of a porous material (also referred to as microporous material) with many micro-pores for absorbing and transferring liquid, such as a porous ceramic material. The liquid transfer unit 1 comprises an air guide part 12, and a base 11 which is connected to and surrounds the air guide part 12. A gap between the air guide part 12 and the base 11 forms an air flow chamber 17. The liquid transfer unit 1 is provided with an air inlet 15 communicated with the air flow chamber 17, an air outlet 16 communicated with the air flow chamber 17, and a liquid inlet part 14 to be in contact with liquid. The heating unit 2 comprises a heating part 21 which generates heat when energized, and electrical connection parts 22 which are connected to the heating part 21 and used for transmitting currents to the heating part 21. The heating part 21 are disposed on an inner wall of the air flow chamber 17 and are in contact with the liquid transfer unit 1, and the electrical connection parts 22 extend out of the air flow chamber 17, such that when the liquid inlet part 14 of the liquid transfer unit 1 contacts the liquid, the liquid is transferred by the liquid transfer unit 1 to the heating part 21 to be heated to generate smoke. An external air flow enters the air flow chamber 17 through the air inlet 15 to take the smoke out through the air outlet 16. Wherein, the porous material may be a porous ceramic material.

[0021] According to the atomizing core provided by the invention, the liquid inlet part 14 of the liquid transfer unit 1 contacts liquid, then the liquid is transferred by the liquid transferred unit 1 onto the heating part 21 of the heating unit 2 to be heated and atomized into smoke, and an air flow passes through an atomization surface (where the heating part 21 of the heating unit 2 heat liquid to generate smoke) to take the smoke out.

[0022] The atomizing core provided by the invention

has the following beneficial effects:

1. Due to the fact that the air flow chamber 17 is disposed in the liquid transfer unit 1 made of a porous material and the heating part 21 of the heating unit 2 are disposed in the air flow chamber 17, the volume, flow rate and path of the air flow are determined mainly by the structure of the liquid transfer unit 1 and is not affected by other parts and the assembly relation of parts, thereby facilitating ensuring good and uniform atomization effect the atomization device.

2. The liquid transfer unit 1 is made of a porous material, so the whole air flow chamber 17 is surrounded by the porous material, and condensate generated in the air flow chamber 17 can be absorbed by the liquid transfer unit 1, thus effectively reducing the quantity of the condensate.

3. When the atomizing core provided by the invention is applied in an atomization device, the air flow chamber 17 is determined mainly by the structure of the liquid transfer unit 1 rather than being cooperatively defined by the liquid transfer unit 1 and other parts, so the structure of the atomization device can be simplified, and the atomizing device can be assembled easily, quickly, stably and reliably.

[0023] The atomizing core provided by the invention can be applied to an atomization device for e-cigarettes to heat and atomize e-liquid. The specific working process is as follows: the liquid inlet part 14 of the liquid transfer unit 1 of the atomizing core contacts e-liquid in the atomization device, then the e-liquid is transferred by the liquid transfer unit 1 onto the heating part 21 of the heating unit 2 to be heated and atomized into smoke, and an external air flow enters the air flow chamber through the air inlet to take the smoke out through the air outlet, such that the smoke can be inhaled by a smoker.

[0024] Preferably, the liquid transfer unit 1 is formed integrally.

[0025] As for the structure of the air flow chamber 17 of the atomizing core, the air flow chamber 17 may be in any shape. To facilitate forming the heating unit 2, the air flow chamber 17 may be an annular ring space (as shown in FIG. 1-FIG. 4). The air flow chamber 17 may be an angular ring space or a polygonal ring space, such as a quadrilateral ring space (as shown in FIG. 5), and in this case, the heating part 21 of the heating unit 2 comprises multiple planar atomization surfaces, such that it becomes easy to control the consistency in forming the heating unit 2, and the porous material can be inlaid more stably. The atomization surface and the air flow chamber 17 may be in other shapes, which will not be illustrated here. Each heating part 21 of the heating unit 2 comprises at least one heating wire that is curved into a ring-shape.

[0026] Referring to FIG. 1-FIG. 4, in some embodiments, in the air flow chamber 17, the heating part 21, a side wall of the air guide part 12 and a side wall of the base 11 correspond to each other in shape and are all ring-shaped, the heating part 21 of the heating unit 2 are disposed on the side wall of the base 11, and the liquid inlet part 14 is disposed on an outer side of the base 11. The liquid inlet part 14 may be a liquid inlet recess formed in the outer side of the base 11.

[0027] Referring to FIG. 6-FIG. 9, in some other embodiments, in the air flow chamber 17, the heating part 21, a side wall of the air guide part 12 and a side wall of the base 11 correspond to each other in shape and are all ring-shaped, and the heating part 21 of the heating unit 2 are disposed on the side wall of the air guide part 12. It can be understood that, in the air flow chamber 17, the heating part 21 may be disposed on both the side wall of the air guide part 12 and the side wall of the base 11. The air inlet part 14 is a liquid inlet recess formed in an outer side of the air guide part 12.

[0028] Preferably, the base 11 comprises a first part 111 and a second part 112, wherein the first part 111 and the second part 112 surround two opposite sides of the air guide part 12 respectively, and one end of the first part 111 and one end of the second part 112 are joined together and are connected to the air guide part 12.

[0029] Preferably, the air inlet 15 is formed in a joint of the base 11 and the air guide part 12.

[0030] Preferably, the other end of the first part 111 and the other end of the second part 112 are suspended separately and define the air outlet 16 therebetween.

[0031] Preferably, the air inlet 15 is formed in a lower side of the liquid transfer unit 1, and the liquid transfer unit 1 comprises a support part 13 connected to the base 11 and/or the air guide part 12 and protruding downwards. The support part 13 is used for supporting the atomizing core and elevating the atomizing core to expose the air inlet 15. The air guide part 12 makes an air flow vertically entering the atomizing core through the air inlet 15 move towards atomization surfaces on two sides, and the air guide part 12 is also made of a porous material, such that atomized smoke in the air flow chamber 17 is unlikely to be condensed, and even if the atomized smoke is condensed, condensate can be reabsorbed by the liquid transfer unit 1.

[0032] From the above description, the atomizing core provided by the invention has the following technical effects:

1. Due to the fact that the air flow chamber 17 is disposed in the liquid transfer unit 1 made of a porous material and the heating part 21 of the heating unit 2 are disposed in the air flow chamber 17, the volume, flow rate and path of the air flow are determined mainly by the structure of the liquid transfer unit 1 and is not affected by other parts and the assembly relation of parts, so the consistency of the atomization effect is guaranteed.

2. The liquid transfer unit 1 is made of a porous material, so the whole air flow chamber 17 is surrounded by the porous material, and condensate generated in the air flow chamber 17 can be absorbed by the liquid transfer unit 1, thus effectively reducing the quantity of the condensate.

3. When the atomizing core provided by the invention is applied to an atomization device, the air flow chamber 17 is determined mainly by the structure of the liquid transfer unit 1 rather than being defined by the liquid transfer unit 1 and other parts, so the structure of the atomization device can be simplified, and the atomizing device can be assembled easily, quickly, stably and reliably.

[0033] The above embodiments are merely preferred ones of the invention, and are not used to limit the invention. Those skilled in the art can make various modifications, combinations and changes to the invention. Any amendments, equivalent substitutions and improvements made based on the spirit and principle of the invention should fall within the scope of the claims.

Claims

1. An atomizing core, **characterized by** comprising a heating unit (2), and a liquid transfer unit (1) made of a porous material and configured for absorbing and transferring liquid, wherein the liquid transfer unit (1) comprises an air guide part (12), and a base (11) which is connected to and surrounds the air guide part (12), a gap between the air guide part (12) and the base (11) forms an air flow chamber (17), the liquid transfer unit (1) is provided with an air inlet (15) communicated with the air flow chamber (17), an air outlet (16) communicated with the air flow chamber (17), and a liquid inlet part (14) to be in contact with the liquid, the heating unit (2) comprises a heating part (21) which generates heat when energized, and electrical connection parts (22) configured for transmitting currents to the heating part (21), the heating part (21) are disposed on an inner wall of the air flow chamber (17) and are in contact with the liquid transfer unit (1), such that when the liquid inlet part (14) of the liquid transfer unit (1) contacts the liquid, the liquid is transferred by the liquid transfer unit (1) onto the heating part (21) to be heated to generate smoke, and an external air flow enters the air flow chamber (17) through the air inlet (15) and takes the smoke out through the air outlet (16).

2. The atomizing core according to Claim 1, **characterized in that** the air flow chamber (17) is an annular ring space, or a ring space with angles.

3. The atomizing core according to Claim 2, **characterized in that** the base (11) comprises a first part (111) and a second part (112), the first part (111) and the second part (112) surround two sides of the air guide part (12) respectively, and one end of the first part (111) and one end of the second part are joined together and are connected to the air guide part (12).

4. The atomizing core according to Claim 3, **characterized in that** in the air flow chamber (17), the heating part (21) are disposed on the base (11), and the liquid inlet part (14) is disposed on an outer side of the base (11).

5. The atomizing core according to Claim 4, **characterized in that** the air inlet part (14) is a liquid inlet recess formed in the outer side of the base (11).

6. The atomizing core according to Claim 3, **characterized in that** in the air flow chamber (17), the heating part (21) are disposed on the air guide part (12).

7. The atomizing core according to Claim 6, **characterized in that** the liquid inlet part (14) is a liquid inlet recess formed in an outer side of the air guide part (12).

8. The atomizing core according to Claim 3, **characterized in that** the air inlet (15) is formed in a joint of the base (11) and the air guide part (12).

9. The atomizing core according to Claim 3, **characterized in that** the other end of the first part (111) and the other end of the second part (112) define the air outlet (16) therebetween.

10. The atomizing core according to Claim 3, **characterized in that** the air inlet (15) is disposed at a lower side of the liquid transfer unit (1), and the liquid transfer unit (1) comprises a support part (13) which is connected to the base (11) and/or the air guide part (12), protrudes downwards and is used for elevating the air inlet (15).

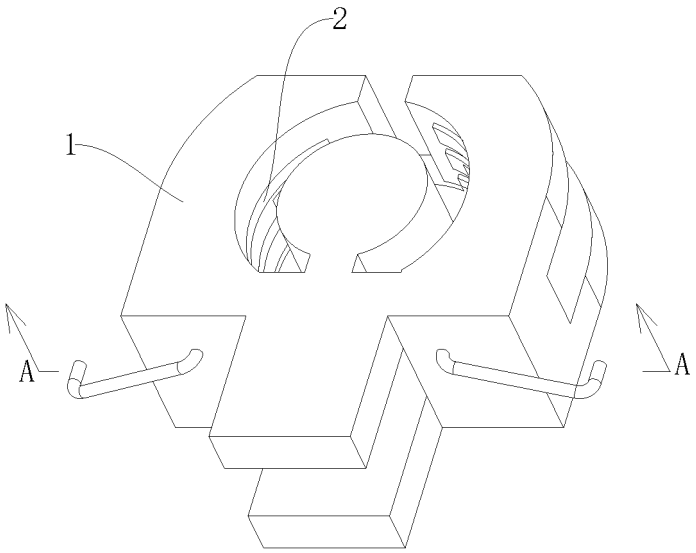

FIG. 1

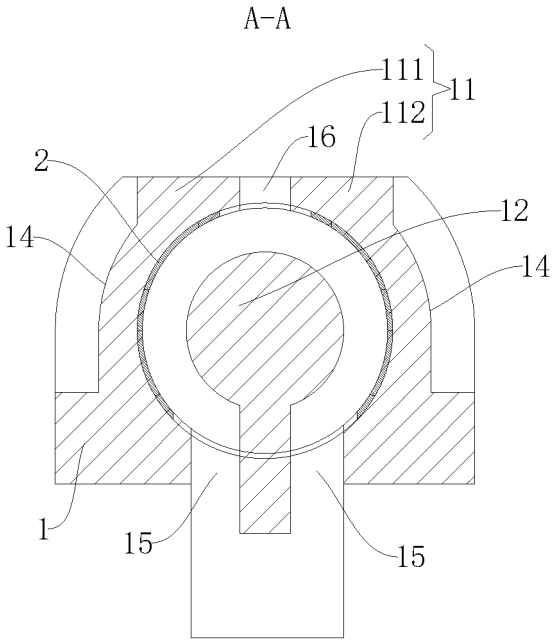

FIG. 2

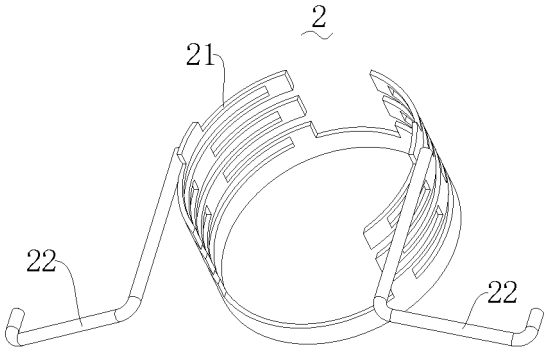

FIG. 3

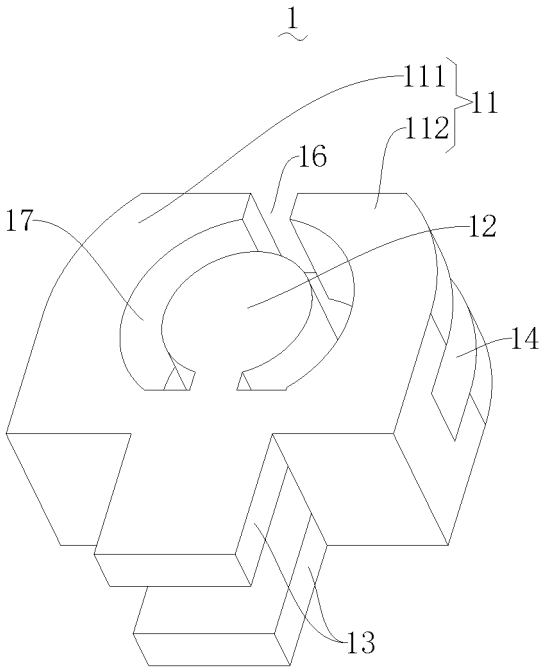

FIG. 4

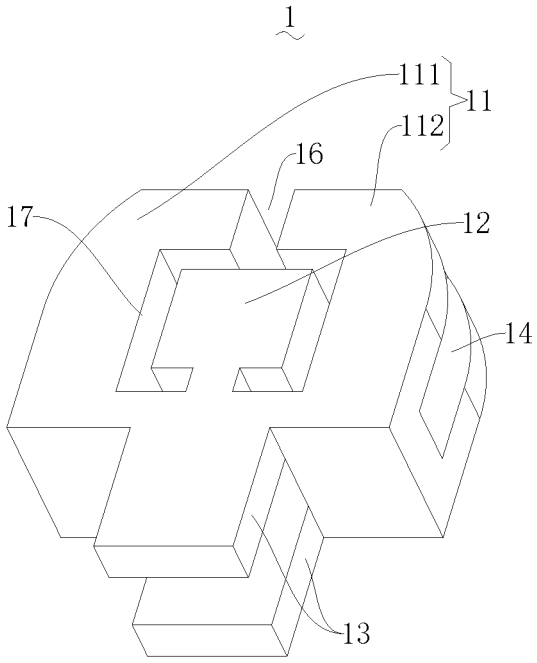

FIG. 5

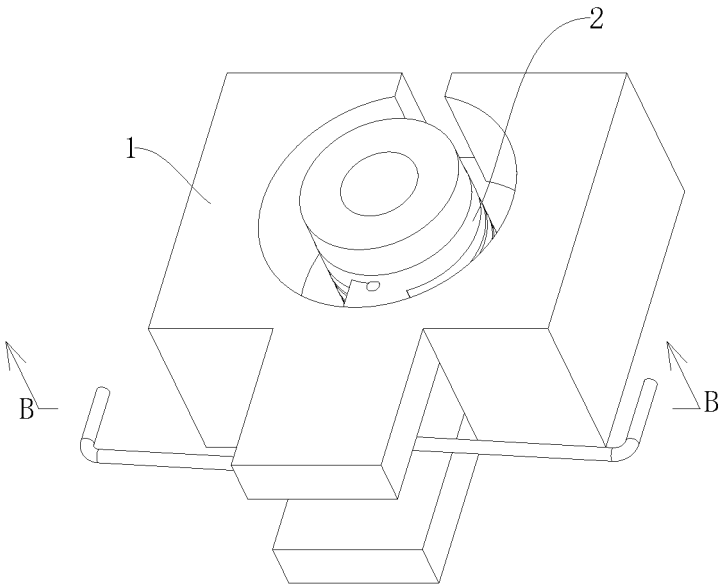

FIG. 6

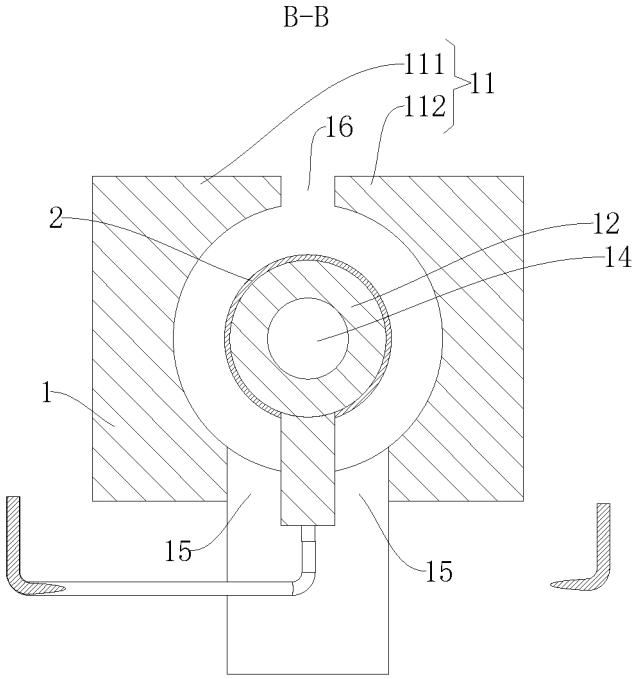

FIG. 7

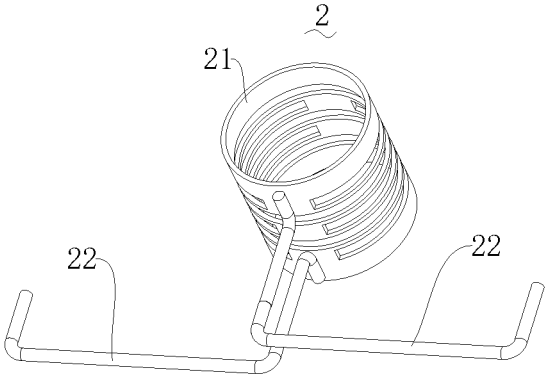

FIG. 8

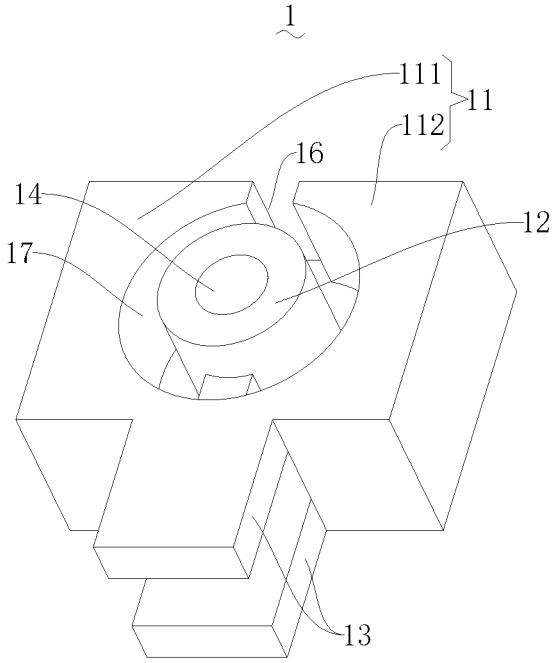

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/140963

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/46(2020.01)i; A24F 40/48(2020.01)i; A24F 40/10(2020.01)i; A24F 40/00(2020.01)i; H05B 3/40(2006.01)n; H05B 3/00(2006.01)n

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)

A24F; H05B

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)

CNTXT; ENTXTC; VEN: 雾化芯, 气流仓, 导液, 导气, 导流, 发热, 电热, 加热, 环形, 环状, 突起, 凸起, 多孔, 微孔, 冷凝, atomiz+, spray+, core, bin?, airflow, air, liquid, guid+, heat+, ring?, annul+, teat?, porous+, condensation

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 107080289 A (LENG CHAOYANG) 22 August 2017 (2017-08-22) description, paragraphs 5-45, and figures 1-17	1
Y	CN 112826132 A (CHANGZHOU PATENT ELECTRONIC TECHNOLOGY CO., LTD.) 25 May 2021 (2021-05-25) description, paragraphs 3-152, and figures 1-3	1
A	EP 3677130 A2 (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 08 July 2020 (2020-07-08) entire document	1-10

☐ 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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"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
22 August 2022	**06 September 2022**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2021/140963

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		KR 102309766 B1	06 October 2021
		EP 3677130 A3	29 July 2020

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