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(71) Applicant: **Shenzhen First Union Technology Co., Ltd.**
Shenzhen, Guangdong 518000 (CN)

(72) Inventors:
• **HUANG, Wenqiang**
Shenzhen, Guangdong 518000 (CN)
• **YUAN, Zhi**
Shenzhen, Guangdong 518000 (CN)

- **ZENG, Qingwen**
Shenzhen, Guangdong 518000 (CN)
- **WANG, Xiaoning**
Shenzhen, Guangdong 518000 (CN)
- **PAN, Kecheng**
Shenzhen, Guangdong 518000 (CN)
- **LEI, Baoling**
Shenzhen, Guangdong 518000 (CN)
- **XU, Zhongli**
Shenzhen, Guangdong 518000 (CN)
- **LI, Yonghai**
Shenzhen, Guangdong 518000 (CN)

(74) Representative: **Ran, Handong et al**
Maucher Jenkins
Seventh Floor Offices
Artillery House
11-19 Artillery Row
London SW1P 1RT (GB)

(54) **ATOMIZATION CORE ASSEMBLY AND MANUFACTURING METHOD THEREFOR, AND AEROSOL GENERATION DEVICE**

(57) An atomization core assembly and a manufacturing method therefor, and an aerosol generation device. The atomization core assembly (20) comprises a porous liquid guide body (21), wherein the porous liquid guide body (21) is configured to absorb and transfer a liquid substrate, and the porous liquid guide body (21) has a liquid absorbing surface (211) and an atomization surface (212) which are longitudinally opposite each other, and a side surface (213) which is connected between the liquid absorbing surface (211) and the atomization surface (212); a heating element (22), which is configured as a resistive heating track and extends over

the atomization surface (213); and a conductive lead (40), which is connected to two ends of a heating element (22), wherein a portion of the conductive lead (40) is embedded in the porous liquid guide body (21), and the other portion of the conductive lead extends from the side surface (213), away from the porous liquid guide body (21) in a direction substantially parallel to the atomization surface (212). The entire atomization core assembly (20) is more suitable for use in a cylindrical or cylinder-like atomizer (100) or an aerosol generation device.

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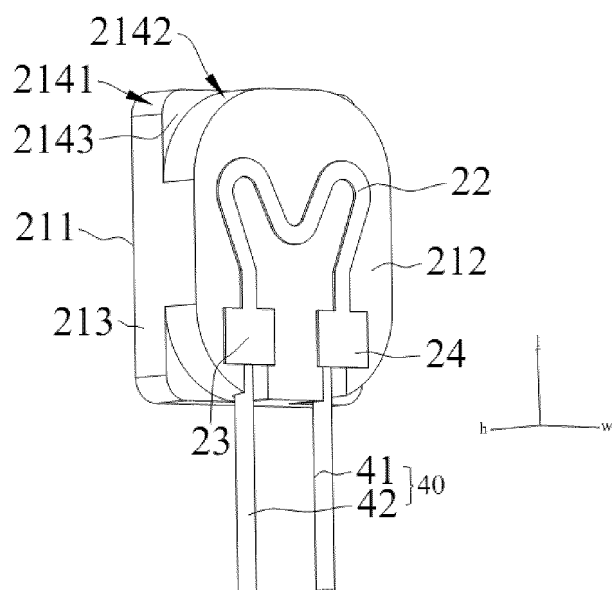


FIG. 3

Description

[0001] This application claims priority to Chinese Patent Application No. 202210476739.4, entitled "ATOMIZATION CORE ASSEMBLY AND MANUFACTURING METHOD THEREFOR, AND AEROSOL GENERATION DEVICE" filed with the China National Intellectual Property Administration on April 30, 2022, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] Embodiments of this application relate to the field of aerosol generation devices, and in particular, to an atomization core assembly and a manufacturing method therefor, and an aerosol generation device.

BACKGROUND

[0003] An aerosol generation device includes an atomizer, a core assembly of the atomizer is an atomization core assembly, and the atomization core assembly atomizes a liquid substrate to generate an aerosol.

[0004] A ceramic atomization core made of a ceramic material in the known art is widely used in an aerosol generation device. The ceramic atomization core mainly includes two types. A first type is a substantially block-shaped ceramic liquid guide body, a heating circuit is printed on an outer surface of the ceramic liquid guide body and silver paste is printed on two sides of the heating circuit to form conductive electrodes, or a heating steel mesh is embedded on the ceramic liquid guide body and conductive leads are connected to two ends of the heating mesh. A second type is a substantially circular-tubular ceramic liquid guide body, a heating mesh or a heating wire is fixed on an inner wall of the ceramic liquid guide body, and conductive leads are connected to two sides of a heating element. A first-type ceramic atomization core is suitable for being transversely fixed inside a flat atomizer due to a large overall thickness of the first-type ceramic atomization core, and a second-type ceramic atomization core is mainly suitable for being fixed inside a cylindrical atomizer. However, a cylindrical ceramic atomization core generally requires a cotton wrapping process, resulting in high difficulty in an assembly process thereof. However, the first-type block-shaped ceramic atomization core is difficult to be used in the cylindrical atomizer or the aerosol generation device due to a size and a fixing problem of the lead.

SUMMARY

[0005] To resolve a problem that a non-circular tubular ceramic atomization core in the known art is difficult to be applied to a cylindrical or cylinder-like atomizer, an embodiment of this application provides an atomization core assembly, including:

a porous liquid guide body, configured to absorb and transfer a liquid substrate, where the porous liquid guide body has a liquid absorbing surface and an atomization surface opposite to each other, and a side surface connected between the liquid absorbing surface and the atomization surface;

a heating element, configured to heat a part of the liquid substrate, where the heating element includes a resistive heating trajectory extending on the atomization surface; and

conductive leads, connected to end portions of the heating element, where a part of the conductive lead is embedded in the porous liquid guide body, and an other part of the conductive lead extends away from the porous liquid guide body from the side surface in a direction substantially parallel to the atomization surface.

[0006] In some embodiments, the conductive leads include a first conductive lead and a second conductive lead, and the first conductive lead and the second conductive lead are led out from a side surface on the same side of the porous liquid guide body.

[0007] In some embodiments, a first lead groove and a second lead groove are provided on the porous liquid guide body, the first conductive lead is accommodated in the first lead groove, and the second conductive lead is accommodated in the second lead groove.

[0008] In some embodiments, the heating element further includes a first electrical connection portion and a second electrical connection portion connected to two ends of the heating trajectory, where the first electrical connection portion is configured to be in contact with at least a part of a surface of the first conductive lead and is configured to fix the first conductive lead, and the second electrical connection portion is configured to be in contact with at least a part of a surface of the second conductive lead and is configured to fix the second conductive lead.

[0009] In some embodiments, at least a part of the first electrical connection portion is filled into the first lead groove from the atomization surface and combined around the first conductive lead, and at least a part of the second electrical connection portion is filled into the second lead groove from the atomization surface and combined around the second conductive lead.

[0010] In some embodiments, a first groove and a second groove are further provided on the porous liquid guide body, the first groove is in communication with the first lead groove, and the second groove is in communication with the second lead groove.

[0011] In some embodiments, a part of the first electrical connection portion is accommodated in the first groove and is configured to fix the first conductive lead; and a part of the second electrical connection portion is accommodated in the second groove and is configured to fix the second conductive lead.

[0012] In some embodiments, a recess depth of the first groove from the atomization surface is less than a

recess depth of the first lead groove, and a recess depth of the second groove from the atomization surface is less than a recess depth of the second lead groove.

[0013] In some embodiments, the first lead groove and the second lead groove are arranged in parallel.

[0014] In some embodiments, the first groove and the first lead groove are combined to form a T-shaped groove; or the second groove and the second lead groove are combined to form a T-shaped groove.

[0015] In some embodiments, the porous liquid guide body includes a main body portion and a boss portion arranged in a thickness direction, a step is formed between the main body portion and the boss portion, and the atomization surface is arranged on the boss portion.

[0016] In some embodiments, both the first lead groove and the second lead groove are provided on the boss portion.

[0017] An embodiment of this application further provides a manufacturing method for the foregoing atomization core assembly. The manufacturing method includes: preparing a porous liquid guide body, and forming a recessed first lead groove and a recessed second lead groove on an atomization surface of the porous liquid guide body; placing a first conductive lead into the first lead groove, and placing a second conductive lead into the second lead groove; and combining conductive paste with the atomization surface of the porous liquid guide body to form a resistive heating trajectory, filling a part of the conductive paste into the first lead groove and the second lead groove, embedding a part of the first conductive lead and a part of the second conductive lead into the porous liquid guide body through curing, and another part of the first conductive lead and another part of the second conductive lead extend away from the porous liquid guide body in a direction substantially parallel to the atomization surface.

[0018] In some embodiments, a first groove and a second groove are provided on the porous liquid guide body, where the first groove is in communication with the first lead groove, and the second groove is in communication with the second lead groove. A part of the conductive paste is filled into the first groove and the second groove.

[0019] In some embodiments, a width of a groove opening of the first lead groove and a width of a groove opening of the second lead groove located on the atomization surface is greater than a width of a groove bottom; or a width of a groove opening of the first groove and a width of a groove opening of the second groove located on the atomization surface is greater than a width of a groove bottom.

[0020] An embodiment of this application further provides an aerosol generation device, including a housing and a liquid storage cavity located in the housing, where the liquid storage cavity is configured to store a liquid substrate, the foregoing atomization core assembly is arranged in the housing, and the atomization core assembly is configured to atomize the liquid substrate to

generate an aerosol; and the atomization core assembly includes an atomization surface, and an extending direction of the atomization surface is arranged in parallel with a longitudinal direction of the housing.

[0021] Beneficial effects of this application are as follows: Because the heating element is configured in such a way that the resistive heating trajectory extends on the atomization surface, atomization efficiency of the heating element is higher than that of an embedded heating steel mesh. Further, a part of the conductive leads connected to two ends of the heating element of the atomization core assembly is embedded into the porous liquid guide body, and another part extends from a side surface of the porous liquid guide body and is fixed in a direction substantially parallel to an atomization surface of the porous liquid guide body, which is beneficial to the atomization core assembly as a whole being fixed inside the atomizer in a direction parallel to the atomization surface of the atomization core assembly, so that the atomization core assembly as a whole is more suitable for being fixed in a cylindrical or cylinder-like atomizer. In addition, a manner of combining the heating trajectory and the conductive leads is beneficial to the application in the cylindrical or cylinder-like atomizer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] One or more embodiments are exemplarily described with reference to the corresponding figures in the accompanying drawings, and the exemplary descriptions are not to be construed as limiting the embodiments. Elements in the accompanying drawings that have same reference numerals are represented as similar elements, and unless otherwise particularly stated, the figures in the accompanying drawings are not drawn to scale.

FIG. 1 is a structural diagram of an aerosol generation device according to an embodiment of this application;

FIG. 2 is a cross-sectional view of an atomizer according to an embodiment of this application;

FIG. 3 is a three-dimensional diagram of an atomization core assembly according to an embodiment of this application;

FIG. 4a is a first heating circuit diagram of a heating element according to an embodiment of this application;

FIG. 4b is a second heating circuit diagram of a heating element according to an embodiment of this application;

FIG. 4c is a third heating circuit diagram of a heating element according to an embodiment of this application;

FIG. 5 is a three-dimensional diagram of a porous liquid guide body according to an embodiment of this application;

FIG. 6 is a three-dimensional diagram of a porous liquid guide body after a conductive lead is placed

therein according to an embodiment of this application;

FIG. 7 is a three-dimensional diagram of an atomization core assembly from another angle of view according to an embodiment of this application; and

FIG. 8 is an exploded view of an atomizer according to an embodiment of this application.

DETAILED DESCRIPTION

[0023] For ease of understanding of this application, this application is described below in more detail with reference to the accompanying drawings and specific implementations.

[0024] It should be noted that all the directional indications (for example, up, down, left, right, front, rear, horizontal, and vertical) in the embodiments of this application are merely used to explain a relative position relationship, a motion status, or the like between components in a specific posture (as shown in the accompanying drawings). If the specific posture changes, the directional indication correspondingly changes, the "connection" may be direct connection or indirect connection, and the "arranged", "arranged at", and "set at" may be directly or indirectly arranged.

[0025] In addition, descriptions involving "first" and "second" in this application are merely used for a purpose of description, and shall not be understood as an indication or implication of relative importance or implicit indication of a quantity of indicated technical features. Therefore, features defined by "first" and "second" may explicitly or implicitly include at least one of the features.

[0026] This application provides an aerosol generation device. The aerosol generation device includes an atomizer and a power supply assembly. The power supply assembly provides electric drive for the atomizer, and the atomizer atomizes a liquid substrate stored inside the atomizer to generate an aerosol. According to different liquid substrates stored in the aerosol generation device, the aerosol generation device may be classified into an electronic cigarette and a medical device. The liquid substrate stored inside the electronic cigarette includes a nicotine preparation, glycerol, propylene glycol, essence fragrances, flavor components, or the like. An aerosol generated by a user inhaling the electronic cigarette mainly meets requirements for nicotine or the flavor components. As the medical device, the liquid substrate stored inside the medical device includes an active functional component, glycerol, propylene glycol, or the like. An aerosol generated by a user inhaling such a device is mainly used for treating respiratory diseases or inhaling a certain pharmaceutical active ingredient through a lung. Related implementations provided in this application may be applied to the foregoing two types of devices, which are not limited herein.

[0027] An atomizer 100 and a power supply assembly 200 may be accommodated inside a housing, to form a portable disposable aerosol generation device with a

small volume. The atomizer 100 and the power supply assembly 200 may alternatively be configured as two independent assemblies, and the two assemblies are connected in a separable connection manner, to form a combined aerosol generation device. In an example, a part of an inner cavity of the housing of the power supply assembly defines an accommodating cavity, the atomizer can be inserted from an end of the housing of the power supply assembly into the accommodating cavity, and at least a part of a surface of the atomizer can be maintained inside the accommodating cavity. The two assemblies may be magnetically attracted or snap connected, so that a stable connection is formed between the two assemblies. In another example, referring to FIG. 1, a threaded sleeve is arranged at an end portion of the atomizer 100, and a threaded groove is provided at an end portion of the power supply assembly 200, so that the two assemblies are in a threaded connection. An electrical connection assembly is arranged at a connection end portion of the atomizer 100 and a connection end portion of the power supply assembly 200, so that after the two assemblies are connected, circuits between the two assemblies remain connected. An internal structure of the power supply assembly 200 may be arranged in a common form in the known art, for example, a control module, a charging module, and the like are arranged inside the power supply assembly. Details are not described in this implementation of this application.

[0028] The following mainly uses a structure of a cylindrical atomizer 100 as an example to describe an internal structure of the atomizer 100. Referring to FIG. 2, the atomizer 100 includes a housing 10, the housing 10 includes a first end and a second end opposite to each other in a longitudinal direction, a mouthpiece 11 is provided at the first end, and a connection base 12 is arranged at the second end. The mouthpiece 11 includes a mouthpiece opening 110 extending longitudinally through the mouthpiece 11, and an aerosol enters a mouth of a user through the mouthpiece opening 110. The mouthpiece 11 is generally made of a plastic material with a high safety level, for example, PPSU, so that the mouthpiece 11 for the user can be improved by being arranged as a flat mouthpiece roughly in a duckbill shape. An end portion of the housing 10 is open, and the mouthpiece 11 is sealingly sleeved on an opening end of the housing 10. In an optional example, the mouthpiece 11 may be a general cylindrical mouthpiece, a plug hole is provided at one end of the housing 10, and the cylindrical mouthpiece is inserted into the plug hole of the housing 10. A second end of the housing 10 is provided as an opening end. Other components inside the atomizer 100 are mounted inside the housing 10 through the opening end. A connection base 12 is arranged at the opening of the second end of the housing 10. The connection base 12 is configured to provide longitudinal support for other components inside the atomizer 100, and a part of the connection base 12 is configured as a threaded electrode. The threaded electrode is screwed into a threaded

groove of the power supply assembly, so that the atomizer 100 is in communication with the power supply assembly 200.

[0029] A part of space inside the housing 10 is provided as a liquid storage cavity 13, and the liquid storage cavity 13 is configured to store a liquid substrate. An atomization assembly is arranged inside the housing 10, the atomization assembly includes an atomization core assembly 20, and the liquid substrate inside the liquid storage cavity 13 can flow to the atomization core assembly 20 and be atomized by the atomization core assembly 20 to generate an aerosol. The atomization assembly further includes a holder 30 configured to hold the atomization core assembly 20. In a cylindrical or cylinder-like atomizer 100, the holder 30 accommodated inside the cylindrical or cylinder-like atomizer 100 is generally configured to be in a circular tube shape or a circular-tube-like shape.

[0030] In the embodiments of this application, a ceramic atomization core assembly 20 with a novel structure and substantially in a flat plate-shape is provided, and can be fixed in an inner cavity of a substantially tubular or tube-like holder 30. Specifically, the atomization core assembly 20 includes a porous liquid guide body 21 and a heating element 22, and the heating element 22 is combined on the porous liquid guide body 21. Referring to FIG. 3 to FIG. 7, the porous liquid guide body 21 is roughly a flat plate-shaped structure, and has a liquid absorbing surface 211 and an atomization surface 212 that are arranged opposite to each other, and four side surfaces 213 connected between the liquid absorbing surface 211 and the atomization surface 212. To facilitate fixing of the porous liquid guide body 21 inside the holder 30, a thickness of the porous liquid guide body 21 is small.

[0031] Further, referring to FIG. 3, the porous liquid guide body 21 includes a length direction 1, a width direction w, and a thickness direction h that are perpendicular to each other, and a length of the side surface 213 of the porous liquid guide body 21 extending in the thickness direction is less than a length of the liquid absorbing surface 211 or the atomization surface 212 extending in the width direction.

[0032] The heating element 22 is combined on the atomization surface 212, the atomization surface 212 and the liquid absorbing surface 211 are arranged opposite to each other, and the liquid substrate inside the liquid storage cavity 13 is configured to flow to the liquid absorbing surface 211 and be transferred to the heating element 22 on the atomization surface through the liquid absorbing surface 211. It may be understood that because the thickness of the porous liquid guide body 21 is small, a path for the liquid substrate to be transferred to the atomization surface 212 through the liquid absorbing surface 211 of the porous liquid guide body 21 is short, and even a liquid substrate with high viscosity can be transferred to the heating element 22 in a short time. Therefore, the heating element is suitable for use in the atomizer 100 with a liquid substrate with high viscosity of

a medical device type.

[0033] Further, because the thickness of the flat plate-shaped porous liquid guide body 21 is small, an overall volume of the porous liquid guide body 21 is small, and the porous liquid guide body 21 is suitable for being fixed in the inner cavity of the holder 30 in a longitudinal direction of the holder 30. In an example, the porous liquid guide body 21 includes a main body portion 2141 and a boss portion 2142, a step 2143 is formed between the main body portion 2141 and the boss portion 2142, and the porous liquid guide body 21 is fixed in the inner cavity of the holder 30 by using the step 2143. The atomization surface 212 is arranged on the boss portion 2142, and the liquid absorbing surface is arranged on the main body portion 2141. A surface area of the atomization surface 212 is less than a surface area of the liquid absorbing surface. A part of a side surface 213 of the boss portion 2142 and a side surface 213 of the main body portion 2141 are arranged on a plane, the other part of the side surface 213 of the boss portion 2142 is arranged as four arc-shaped curved surfaces, and the four arc-shaped curved surfaces are respectively located at four corners of the porous liquid guide body 21. It may be understood that, the atomization surface 212 may alternatively be arranged on the main body portion 2141, and the liquid absorbing surface may alternatively be arranged on the boss portion 2142. In another example, alternatively, a protruding structure may be directly arranged on the side surface 213 of the porous liquid guide body 21 for fixing. In another example, a concave structure may be arranged on the liquid absorbing surface 211 of the porous liquid guide body 21 as required, to store a part of the liquid substrate.

[0034] The heating element 22 is printed on the atomization surface 212 of the porous liquid guide body 21 by using a heating trajectory. Compared with a design structure of embedding a heating wire in a cylindrical ceramic atomization core, atomization efficiency of the heating trajectory printed through a rear film on a flat plate-shaped porous liquid guide body is significantly improved. Specifically, a heating power of the heating trajectory printed through the rear film is usually 6.5 W, and a TPM (a quantity of smoke inhaled per puff) of the atomizer 100 is 6 mg/puff. However, in a manner of embedding the heating wire on the ceramic atomization core, a heating power of the heating element is usually 9 W to 10 W, and the TPM (a quantity of smoke inhaled per puff) of the atomizer 100 is 3.5 mg/puff. In addition, the cylindrical ceramic atomization core needs to be wrapped with cotton, resulting in a poor ventilation effect of the atomization core assembly.

[0035] Further, the heating trajectory may be designed in a plurality of forms, and the heating trajectory is evenly distributed on the atomization surface 212, which is beneficial to balancing atomization efficiency on all parts of the atomization surface 212, and avoids dry burning caused by an excessively high atomization rate caused by dense local heating trajectories and inappropriate

supply of the liquid substrate.

[0036] Referring to FIG. 4a to FIG. 4c, the heating trajectory is formed by connecting several same or similar base units. In an example, the heating trajectory is formed by connecting two arched units, and the two arched units are symmetrically arranged about a central axis of the atomization surface 212, as shown in FIG. 4a. In another example, the heating trajectory includes three base units connected, namely, a first base unit, a second base unit, and a third base unit, where the second base unit is connected to the first base unit and the third base unit head to tail respectively, the first base unit and the third base unit are symmetrically arranged on two sides of the second unit, and a central axis of the second base unit coincides with the central axis of the atomization surface 212. A shape of the third base unit may be different from shapes of the first base unit and the second base unit, as shown in FIG. 4b and FIG. 4c.

[0037] The heating element 22 further includes a first electrical connection portion 23 and a second electrical connection portion 24 connected to two ends of the heating trajectory. The first electrical connection portion 23 and the second electrical connection portion 24 are configured in a rectangular shape, and the heating trajectory is connected to a middle position of the first electrical connection portion 23 or the second electrical connection portion 24, or the heating trajectory is connected to a side edge of the first electrical connection portion 23 or the second electrical connection portion 24. The first electrical connection portion 23 and the second electrical connection portion 24 are symmetrically arranged with respect to the central axis of the atomization surface 212.

[0038] In a cylindrical atomizer 100, the heating element 22 of the atomization core assembly 20 is connected to the threaded electrode on the connection base 12 through a conductive lead. In the embodiments provided in this application, the foregoing porous liquid guide body 21 printed with the heating trajectory is connected to the threaded electrode through the conductive lead. Specifically, referring to FIG. 2, FIG. 3, and FIG. 6, the conductive lead 40 is connected to an end portion of the heating element 22, and a part of the conductive lead 40 is embedded into an interior of the porous liquid guide body 21, so that the conductive lead 40 and the heating element 22 are connected and fixed, and a remaining part of the conductive lead 40 remains extending longitudinally parallel to the atomization surface 212 of the porous liquid guide body 21 after being led out from the side surface of the porous liquid guide body 21, which is beneficial to overall fixed and mounting of the atomization core assembly 20.

[0039] Specifically, the conductive leads 40 include a first conductive lead 41 and a second conductive lead 42, and the first conductive lead 41 and the second conductive lead 42 are respectively connected to the first electrical connection portion 23 and the second electrical connection portion 24. In the cylindrical atomizer 100,

the atomization core assembly 20 is fixed in the inner cavity of the holder 30 in a length direction of the atomization core assembly 20, and both the first conductive lead 41 and the second conductive lead 42 extend in the length direction of the porous liquid guide body 21.

[0040] In an example, the first conductive lead 41 is soldered to the first electrical connection portion 23, and the second conductive lead 42 is soldered to the second electrical connection portion 24. To facilitate an electrical connection between the conductive lead 40 and the heating element 22, the first electrical connection portion 23 and the second electrical connection portion 24 have a large enough area, so that the first conductive lead 41 and the second conductive lead 42 have a large enough soldering surface. It may be understood that, when the area of the first electrical connection portion 23 and the second electrical connection portion 24 is large, the atomization surface 212 should have a large surface area, resulting in a large volume of an entire porous liquid guide body 21, which is not conducive to mounting in an existing cylindrical atomizer 100 with a small overall volume. In addition, the first electrical connection portion 23 and the second electrical connection portion 24 are mainly for conductivity. When the area of the first electrical connection portion 23 and the second electrical connection portion 24 increases, the first electrical connection portion 23 and the second electrical connection portion 24 generate a lot of heat waste, which is not beneficial to improving atomization efficiency of the atomizer 100.

[0041] To optimize an overall structure of the atomization core assembly 20, in a preferred implementation provided in this application, referring to FIG. 5 to FIG. 7, two lead grooves, respectively a first lead groove 251 and a second lead groove 252, are provided on the porous liquid guide body 21. The first conductive lead 41 is fixed in the first lead groove 251, and the second conductive lead 42 is fixed in the second lead groove 252. The lead groove is provided on the atomization surface 212 and runs through the porous liquid guide body 21 to the side surface 213 of the porous liquid guide body 21 in the length direction of the porous liquid guide body 21. When the atomization surface 212 is arranged on the boss portion 2142 of the porous liquid guide body 21, the lead groove is also provided on the boss portion 2142. The first lead groove 251 and the second lead groove 252 may be provided in parallel, and the first lead groove 251 and the second lead groove 252 are symmetrically provided about the central axis of the atomization surface 212. The first lead groove 251 and the second lead groove 252 may alternatively be provided in non-parallel. For example, the first lead groove 251 extends to one of the side surfaces 213, and the second lead groove 252 extends to another side surface 213. The depths and widths of the first lead groove 251 and the second lead groove 252 are configured to accommodate the conductive leads 40.

[0042] To facilitate fixing of the conductive leads 40 in

the lead grooves, the first electrical connection portion 23 is configured to cover at least a part of the opening end of the first lead groove 251, and the second electrical connection portion 24 is configured to cover at least a part of the opening end of the second lead groove 252. The first electrical connection portion 23 is configured to abut against an outer surface of the first conductive lead 41 in a depth direction of the first lead groove 251, and the second electrical connection portion 24 is configured to abut against an outer surface of the second conductive lead 42 in a depth direction of the second lead groove 252. In addition, because the first electrical connection portion 23 covers at least a part of the outer surface of the first conductive lead 41, the first electrical connection portion 23 maintains stable electrical contact with the first conductive lead 41. Because the second electrical connection portion 24 covers at least a part of the outer surface of the second conductive lead 42, the second electrical connection portion 24 maintains stable electrical contact with the second conductive lead 42. When the first electrical connection portion 23 covers the first conductive lead 41 with a sufficient length, the first conductive lead 41 can be stably accommodated inside the first lead groove 251, and the first electrical connection portion 23 and the first conductive lead 41 have a large electrical contact area, so that the first conductive lead 41 can establish a stable electrical connection state with the first electrical connection portion 23. Similarly, when the second electrical connection portion 24 covers the second conductive lead 42 with a sufficient length, the second conductive lead 42 can be stably accommodated inside the second lead groove 252, and the second electrical connection portion 24 and the second conductive lead 42 have a large electrical contact area, so that the second conductive lead 42 can establish a stable electrical connection state with the second electrical connection portion 24.

[0043] Further, a first groove 261 and a second groove 262 are further provided on the porous liquid guide body 21, where the first groove 261 is in communication with the first lead groove 251, and the second groove 262 is in communication with the second lead groove 252. The first electrical connection portion 23 includes a first portion and a third portion. The first portion of the first electrical connection portion 23 covers at least a part of the opening end of the first lead groove 251, and a second portion of the first electrical connection portion 23 is accommodated in the first groove 261, so that the third portion of the first electrical connection portion 23 can abut against the outer surface of the first conductive lead 41 in the width direction of the first lead groove 251, and the first conductive lead 41 is simultaneously subjected to abutting actions in the depth direction and the width direction of the first lead groove 251 when fixed in the first lead groove 251. Therefore, the first electrical connection portion 23 cannot be displaced in the first lead groove 251. Similarly, the second electrical connection portion 24 includes a second portion and a fourth portion.

The second portion of the second electrical connection portion 24 covers at least a part of the opening end of the first lead groove 251, and the fourth portion of the second electrical connection portion 24 is accommodated in the second groove 262, so that the second portion of the second electrical connection portion 24 can abut against the outer surface of the second conductive lead 42 in the width direction of the second lead groove 252, and the second conductive lead 42 is simultaneously subjected to abutting actions in the depth direction and the width direction of the second lead groove 252 when fixed in the second lead groove 252. Therefore, the second electrical connection portion 24 cannot be displaced in the second lead groove 252.

[0044] It may be understood that, when the first electrical connection portion 23 includes the first portion and the third portion, a length of the first portion of the first electrical connection portion 23 may be appropriately reduced. The first groove 261 may be separately arranged on one side of the first lead groove 251, and the first groove 261 and the first lead groove 251 are combined to form a T-shaped groove, or a central axis of the first groove 261 and a central axis of the first lead groove 251 are arranged at a specific angle. In another example, the first groove 261 may alternatively be arranged on two sides of the first lead groove 251, and the first groove 261 and the first lead groove 251 are combined to form a cross-shaped groove, or the central axis of the first groove 261 and the central axis of the first lead groove 251 are intersected in an X shape. A depth of the first groove 261 is less than a depth of the first lead groove 251, and the first groove 261 is provided close to an end portion of the first lead groove 251, which is beneficial to reducing an overall surface area of the first electrical connection portion 23, thereby reducing heat loss generated by the first electrical connection portion 23. Similarly, when the second electrical connection portion 24 includes the second portion and the fourth portion, a length of the second portion of the second electrical connection portion 24 can be appropriately reduced. The second groove 262 may be separately arranged on one side of the second lead groove 252, and the second groove 262 and the first lead groove 251 are combined to form a T-shaped groove, or a central axis of the second groove 262 and a central axis of the second lead groove 252 are arranged at a specific angle. In another example, the second groove 262 may alternatively be arranged on two sides of the second lead groove 252, and the second groove 262 and the second lead groove 252 are combined to form a cross-shaped groove, or the central axis of the second groove 262 and the central axis of the second lead groove 252 are intersected in an X shape. A depth of the second groove 262 is less than a depth of the second lead groove 252, and the second groove 262 is provided close to an end portion of the second lead groove 252, which is beneficial to reducing an overall surface area of the second electrical connection portion 24, thereby redu-

cing heat loss generated by the second electrical connection portion 24. A size of an opening end of the first groove 261 or the second groove 262 is greater than a size of a groove bottom of the first groove 261 or the second groove 262, which is beneficial to filling the second portion of the first electrical connection portion 23 or the fourth portion of the second electrical connection portion 24. A size of an opening end of the first lead groove 251 or the second lead groove 252 is greater than a size of a groove bottom of the first lead groove 251 or the second lead groove 252, which is conducive to a fixing operation of the conductive lead in the lead groove.

[0045] In an example, a depth of the first groove 261 or the second groove 262 is 0.3 mm, and a chamfer is provided at an opening end of the first groove 261 or the second groove 262 located on the atomization surface 212, to facilitate molding and manufacturing of the porous liquid guide body 21, and facilitate filling of the second portion of the first electrical connection portion 23 or the second portion of the second electrical connection portion 24 inside the first groove 261 or the second groove 262. A depth of the first lead groove 251 or the second lead groove 252 is 0.5 mm, a groove bottom of the first lead groove 251 or the second lead groove 252 is set as a semicircular arc with a radius of 0.3 mm, and a size of an opening end of the first lead groove 251 or the second lead groove 252 ranges from 0.3 mm to 1.5 mm. An outer diameter of the conductive lead arranged in the first lead groove 251 or the second lead groove 252 is a nickel wire with an outer diameter of 0.3 mm. It may be understood that, when the outer diameter of the conductive lead changes, the size and the depth of the opening end of the first lead groove 251 or the second lead groove 252, and a radius of the semicircular arc at the groove bottom are all adjusted accordingly, so that a part of the conductive lead can be completely accommodated in the lead groove. Depths of the first groove 261 and the second groove 262 are configured as the second portion of the first electrical connection portion 23 or the second portion of the second electrical connection portion 24, which can form contact abutment against the conductive lead in the width direction of the lead groove. A length of the atomization surface 212 of the porous liquid guide body 21 is 5 mm, a width is 4 mm, a width of the heating trajectory is 0.3 mm, and a thickness is 0.1 mm. A width by which the heating trajectory extends on the atomization surface 212 may be optimized and designed based on atomization efficiency.

[0046] Another embodiment of this application further provides a manufacturing method for the foregoing atomization core assembly, which includes the following steps:

Step 1: Manufacture a ceramic substrate: Ceramic powder, a sintering agent, an organic auxiliary agent, and a pore former are mixed to obtain a ceramic paste, injection molding is performed on the ceramic paste to obtain a ceramic green body, and the cera-

mic green body is defatted and sintered to obtain a porous ceramic substrate. The ceramic powder includes at least one of aluminum oxide, zirconium oxide, silicon oxide, silicon nitride, cordierite, or mullite. The sintering agent includes at least one of calcium carbonate, magnesium oxide, lanthanum oxide, barium oxide, zinc oxide, or lithium oxide. The porous former includes at least one of mineral wax, white wax, beeswax, or ozokerite. To promote mixing uniformity of the ceramic paste, an organic auxiliary agent is added. The organic auxiliary agent includes at least one of an aliphatic acid-based dispersing agent or an acrylic resin-based dispersing agent. Based on a weight percentage of the ceramic paste, a mass percentage of the ceramic powder accounts for 30% to 50%, a weight percentage of the sintering agent accounts for 15% to 30%, and a weight percentage of the porous former accounts for 20% to 40%. During the molding, an injection pressure of an injection molding machine ranges from 0.5 MPa to 5 MPa, and an injection temperature ranges from 50 °C to 100 °C.

Step 2: Place the conductive lead: The first conductive lead is placed in the first lead groove 251, and the second conductive lead 42 is placed in the second lead groove 252.

Step 3: Printing the heating trajectory: The resistive paste is printed through the rear film to obtain a heating trajectory in a specific shape, the resistive paste of the first electrical connection portion 23 is printed on corresponding regions of the atomization surface 212 respectively, and a part of the conductive paste is filled into the first lead groove 251 and the second lead groove 252, a part of the first conductive lead and the second conductive lead are embedded in the porous liquid guide body through curing, and another part of the first conductive lead and the second conductive lead respectively extend away from the porous liquid guide body in a direction substantially parallel to the atomization surface.

[0047] Further, to facilitate the injection of the conductive paste, the first groove and the second groove are arranged on the porous liquid guide body, where the first groove is in communication with the first lead groove, the second groove is in communication with the second lead groove, and a part of the conductive paste is filled in the first groove and the second groove respectively, so that the first electrical connection portion 23 is in fixed contact with the first conductive lead 41. The second electrical connection portion 24 is in fixed contact with the second conductive lead 42.

[0048] Further, to facilitate placing the first conductive lead, the second conductive lead, and guiding the conductive paste to flow into the first lead groove and the second lead groove, a width of a groove opening of the first lead groove and a width of a groove opening of the second lead groove located on the atomization surface is

greater than a width of the groove bottom. When the porous liquid guide body is further provided with the first groove and the second groove, a width of a groove opening of the first groove and a width of a groove opening of the second groove located on the atomization surface is greater than a width of the groove bottom.

[0049] Step 4: Sintering: Integrated sintering is performed on the heating trajectory, the conductive lead, and the ceramic, to obtain the atomization core assembly.

[0050] It may be understood that, in the foregoing manufacturing process, the conductive lead 40 only needs to be placed in the lead groove, and fixing of the conductive lead is completed through subsequent printing and filling of the resistive paste. Compared with welding the conductive lead on the first electrical connection portion 23 or the second electrical connection portion 24, the combination of the conductive leads 40 with the first electrical connection portion 23 and the second electrical connection portion 24 is more stable, and a welding process can be omitted, which is beneficial to implementing an automated forming process of the atomization core assembly 20.

[0051] Further, the foregoing atomization core assembly 20 is fixed in an inner cavity of a substantially tubular holder 30 in the length direction of the atomization core assembly 20 by using a support assembly. In an example, referring to FIG. 2 and FIG. 8, the support assembly includes a seal element 51, an upper support frame 52, and a lower support frame 53. The seal element 51 is arranged around a side of the liquid absorbing surface 211 of the porous liquid guide body 21, and the upper support frame 52 and the lower support frame 53 are arranged around a side of the atomization surface 212 of the porous liquid guide body 21 in a manner of being inserted with each other. A part of the upper support frame 52 abuts between an upper end of the seal element 51 and an inner wall of the holder 30, and a part of the upper support frame 52 is inserted on the seal element 51. A part of the lower support frame 53 abuts between a lower end of the seal element 51 and the inner wall of the holder 30, and a part of the lower support frame 53 is inserted on the seal element 51. The seal element 51 is wrapped around a periphery of the liquid absorbing surface 211 and most of the side surface 213 of the porous liquid guide body 21, and two side walls of the seal element 51 abut against two sides of the boss portion 2142 of the porous liquid guide body 21. A first opening 511 is further provided on the seal element 51, and the liquid absorbing surface 211 of the porous liquid guide body 21 is exposed through the first opening 511. A liquid inlet 31 is arranged on a side of the holder 30, the first opening 511 of the seal element 51 is arranged directly facing the liquid inlet 31 on the holder 30, and a size of the first opening 511 on the seal element 51 is substantially the same as a size of the liquid inlet 31. A wall surface around the first opening 511 of the seal element 51 is arranged protruding relative to the liquid absorbing surface 211 of the porous liquid guide body 21. Therefore,

the seal element 51 and the holder 30 jointly define to form an open liquid guide cavity 32, the liquid substrate inside the liquid storage cavity 13 enters through an opening end of the liquid guide cavity 32, and the liquid absorbing surface 211 of the porous liquid guide body 21 is in direct contact with a substrate inside the liquid guide cavity 32, so that the liquid absorbing surface 211 of the porous liquid guide body 21 is in a relatively stable liquid supply environment. Further, a second opening 521 is arranged at an end portion of the upper support frame 52, and a third opening 531 is arranged at an end portion of the lower support frame 53. The second opening 521 and the third opening 531 are arranged directly opposite to each other, an airflow channel 60 in communication is formed between the second opening 521 and the third opening 531, and the atomization surface 212 of the porous liquid guide body 21 is arranged on a side of the airflow channel 60.

[0052] A lower end surface of the lower support frame 53 abuts against an inner annular wall of the connection base 12. An air inlet 121 is provided on a side wall of the connection base 12. An external airflow is guided into an inner cavity of the connection base 12 through the air inlet 121, and is guided into the airflow channel 60 through the third opening 531 of the lower support frame 53, to reach the atomization surface 212. In addition, an aerosol generated on the atomization surface 212 by atomization by the heating element 22 reaches the second opening 521 of the upper support frame 52 through the airflow channel. The second opening 521 of the upper support frame 52 is in communication with the inner cavity of the holder 30. An air outlet channel 14 may be defined by the inner cavity of the holder 30, that is, the holder 30 extends longitudinally along the housing 10 by a sufficient length, and an upper end of the holder 30 extends into an inner cavity of the mouthpiece 11. In another example, an air outlet tube is connected to an end of the holder 30. The air outlet tube may be defined by an inner wall of the housing 10, or the air outlet tube may be separately arranged and connected between the holder 30 and the mouthpiece opening 110 of the housing 10, and an inner cavity of the air outlet tube is in communication with the inner cavity of the holder 30 to form the air outlet channel 14. The aerosol is outputted through the second opening of the upper support frame 52 and then enters the air outlet channel 14, and is guided to the mouthpiece opening 110 through the air outlet channel 14 and inhaled by the user.

[0053] It should be noted that, the specification of this application and the accompanying drawings thereof illustrate preferred embodiments of this application, but this application is not limited to the embodiments described in the specification. Further, a person of ordinary skill in the art may make improvements or variations according to the foregoing description, and all the improvements and variations shall fall within the protection scope of the appended claims of this application.

Claims

1. An atomization core assembly, **characterized by** comprising:

a porous liquid guide body, configured to absorb and transfer a liquid substrate, wherein the porous liquid guide body has a liquid absorbing surface and an atomization surface opposite to each other, and a side surface connected between the liquid absorbing surface and the atomization surface;

a heating element, configured to heat a part of the liquid substrate, wherein the heating element comprises a resistive heating trajectory extending on the atomization surface; and conductive leads, connected to end portions of the heating element, wherein a part of the conductive lead is embedded in the porous liquid guide body, and an other part of the conductive lead extends away from the porous liquid guide body from the side surface in a direction substantially parallel to the atomization surface.

2. The atomization core assembly according to claim 1, wherein the conductive leads comprise a first conductive lead and a second conductive lead, and the first conductive lead and the second conductive lead are led out from a side surface on a same side of the porous liquid guide body.

3. The atomization core assembly according to claim 2, wherein a first lead groove and a second lead groove are provided on the porous liquid guide body, the first conductive lead is accommodated in the first lead groove, and the second conductive lead is accommodated in the second lead groove.

4. The atomization core assembly according to claim 3, wherein the heating element further comprises a first electrical connection portion and a second electrical connection portion connected to two ends of the heating trajectory, wherein the first electrical connection portion is configured to be in contact with at least a part of a surface of the first conductive lead and is configured to fix the first conductive lead, and the second electrical connection portion is configured to be in contact with at least a part of a surface of the second conductive lead and is configured to fix the second conductive lead.

5. The atomization core assembly according to claim 4, wherein at least a part of the first electrical connection portion is filled into the first lead groove from the atomization surface and is combined around the first conductive lead, and at least a part of the second conductive connection is filled into the second lead groove from the atomization surface and is com-

bined around the second conductive lead.

6. The atomization core assembly according to claim 4, wherein a first groove and a second groove are further provided on the porous liquid guide body, the first groove is in communication with the first lead groove, and the second groove is in communication with the second lead groove.

7. The atomization core assembly according to claim 6, wherein a part of the first electrical connection portion is accommodated in the first groove and is configured to fix the first conductive lead; and a part of the second electrical connection portion is accommodated in the second groove and is configured to fix the second conductive lead.

8. The atomization core assembly according to claim 6, wherein a recess depth of the first groove from the atomization surface is less than a recess depth of the first lead groove, and a recess depth of the second groove from the atomization surface is less than a recess depth of the second lead groove.

9. The atomization core assembly according to claim 3, wherein the first lead groove and the second lead groove are arranged in parallel.

10. The atomization core assembly according to claim 6, wherein the first groove and the first lead groove are combined to form a T-shaped groove; or the second groove and the second lead groove are combined to form a T-shaped groove.

11. The atomization core assembly according to claim 3, wherein the porous liquid guide body comprises a main body portion and a boss portion arranged in a thickness direction, a step is formed between the main body portion and the boss portion, and the atomization surface is arranged on the boss portion.

12. The atomization core assembly according to claim 11, wherein both the first lead groove and the second lead groove are provided on the boss portion.

13. A manufacturing method for an atomization core assembly, **characterized by** comprising:

preparing a porous liquid guide body, and forming a recessed first lead groove and a recessed second lead groove on an atomization surface of the porous liquid guide body;
placing a first conductive lead into the first lead groove, and placing a second conductive lead into the second lead groove; and
combining conductive paste with the atomization surface of the porous liquid guide body to form a resistive heating trajectory, filling a part of

the conductive paste into the first lead groove and the second lead groove, embedding a part of the first conductive lead and a part of the second conductive lead into the porous liquid guide body through curing, and an other part of the first conductive lead and an other part of the second conductive lead extending away from the porous liquid guide body in a direction substantially parallel to the atomization surface.

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14. The manufacturing method for an atomization core assembly according to claim 13, wherein a first groove and a second groove are provided on the porous liquid guide body, wherein the first groove is in communication with the first lead groove, and the second groove is in communication with the second lead groove; and a part of the conductive paste is filled into the first groove and the second groove.

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15. The manufacturing method for an atomization core assembly according to claim 14, wherein a width of a groove opening of the first lead groove and a width of a groove opening of the second lead groove located on the atomization surface are greater than a width of a groove bottom; or a width of a groove opening of the first groove and a width of a groove opening of the second groove located on the atomization surface are greater than a width of a groove bottom.

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16. An aerosol generation device, comprising: a housing and a liquid storage cavity located in the housing, wherein the liquid storage cavity is configured to store a liquid substrate, the atomization core assembly according to any one of claims 1 to 12 is arranged in the housing, and the atomization core assembly is configured to atomize the liquid substrate to generate an aerosol; and the atomization core assembly comprises an atomization surface, and an extending direction of the atomization surface is arranged in parallel with a longitudinal direction of the housing.

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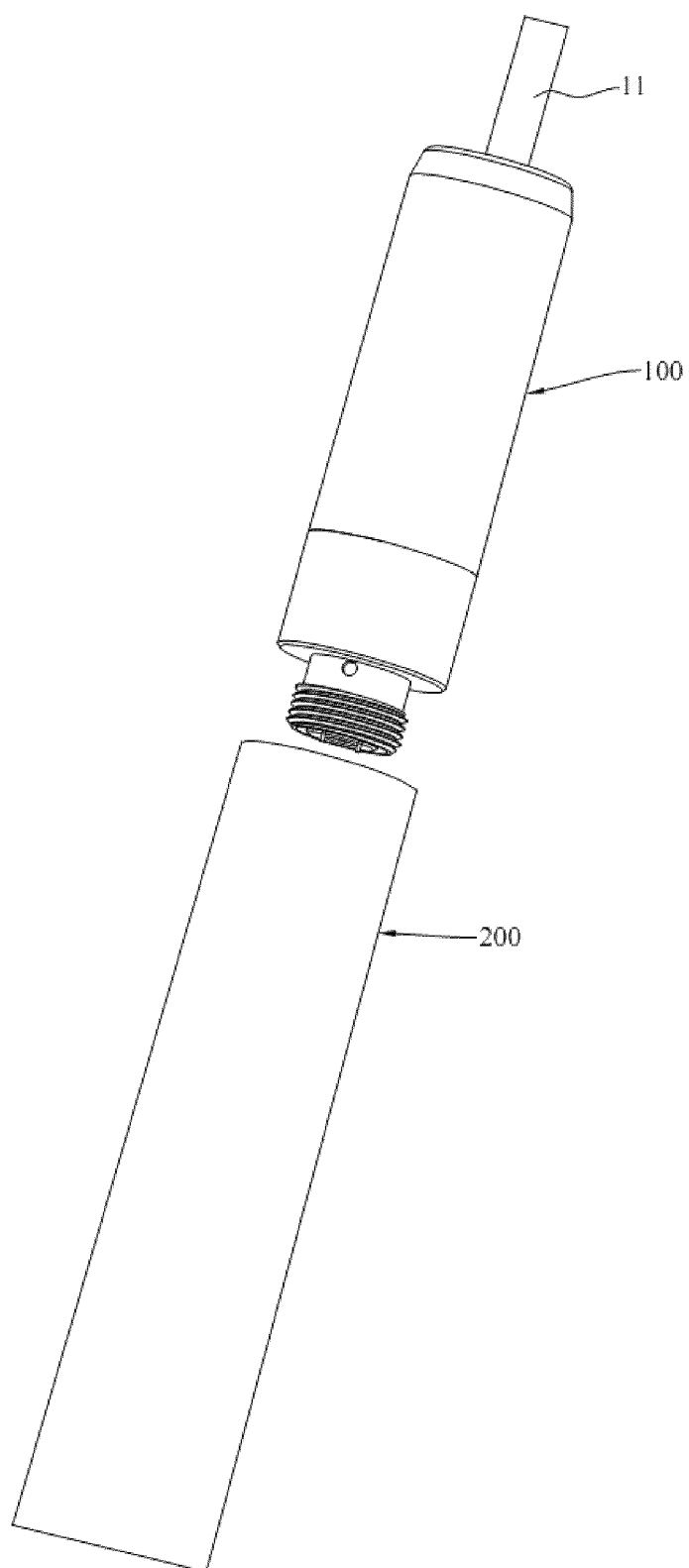


FIG. 1

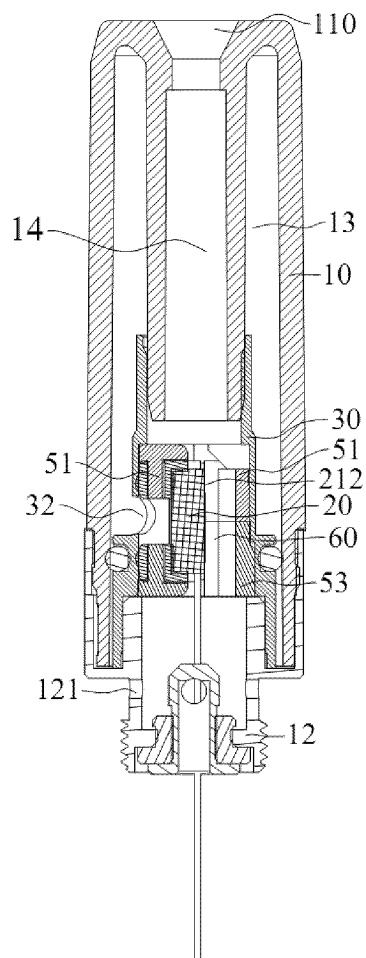


FIG. 2

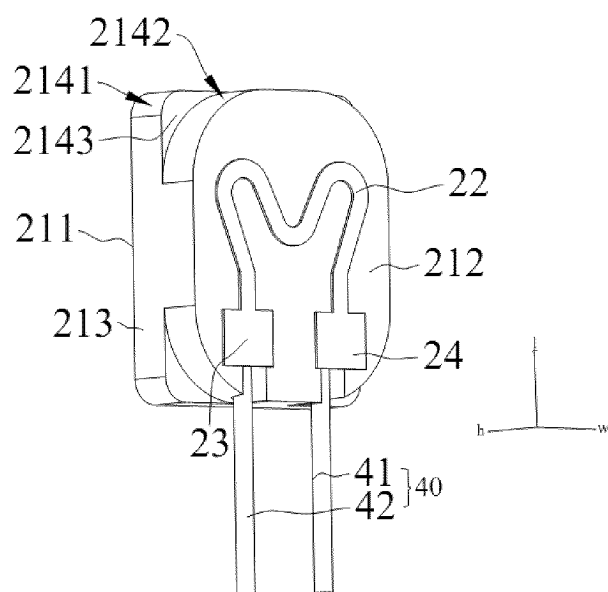


FIG. 3

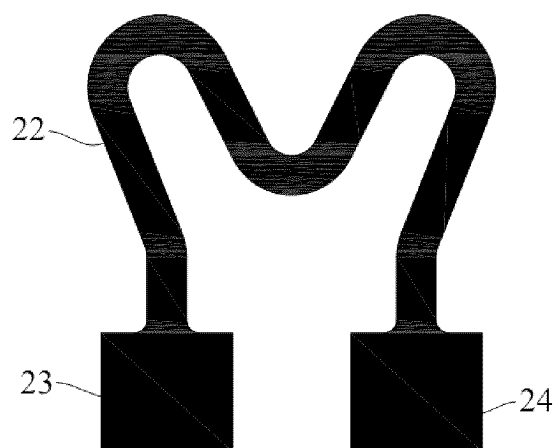


FIG. 4a

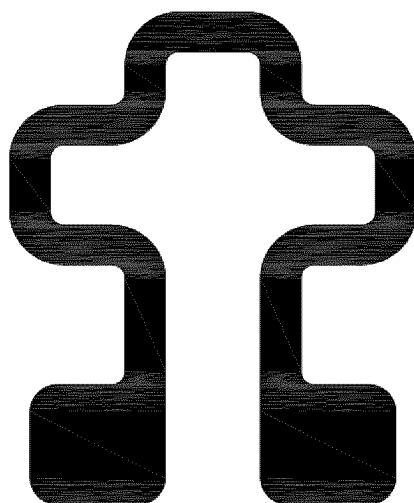


FIG. 4b

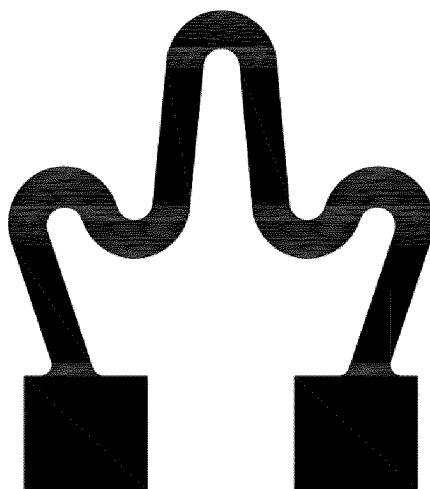


FIG. 4c

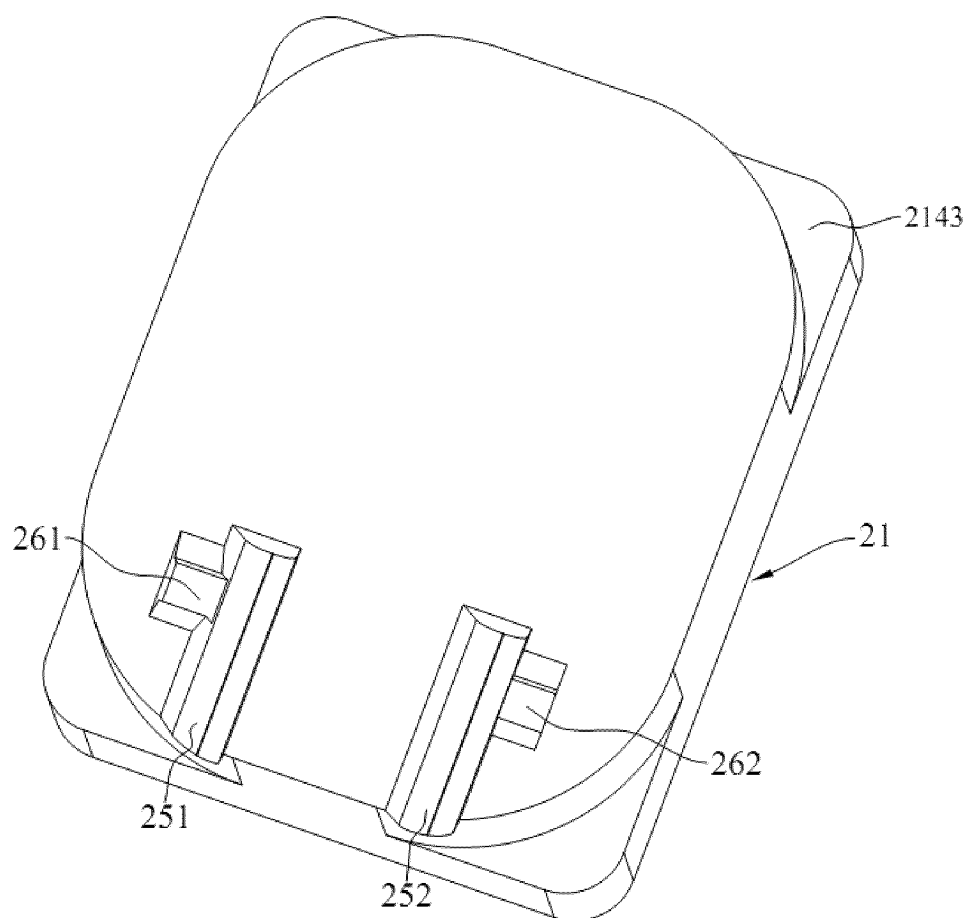


FIG. 5

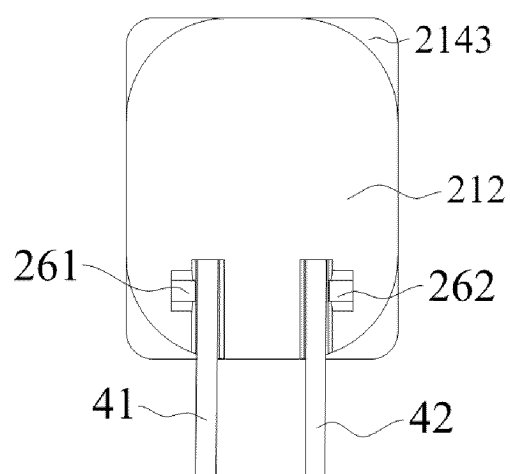


FIG. 6

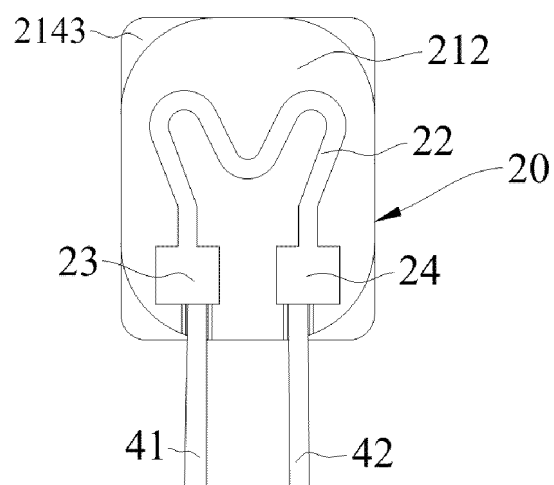


FIG. 7

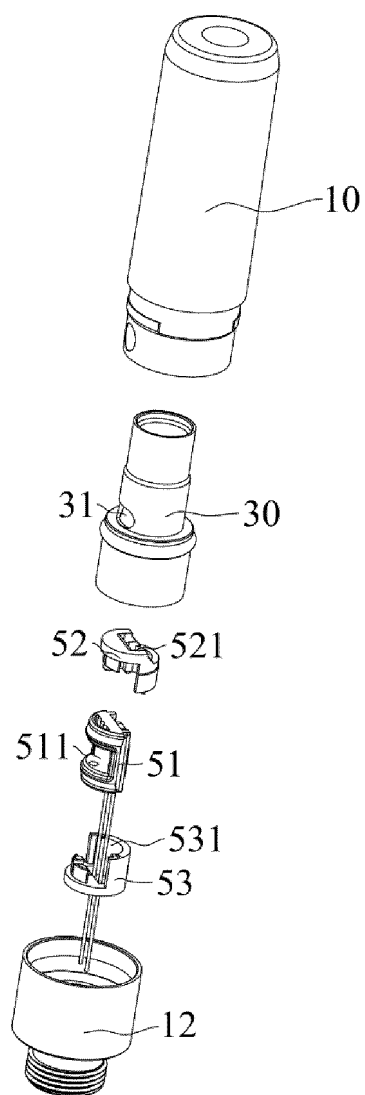


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/090263

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/10(2020.01)i; A24F 40/40(2020.01)i; A24F 40/46(2020.01)i; A24F 40/48(2020.01)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)

IPC: A24F 40/-; A24F 47/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNKI, CNABS, CNTXT, ENTXTC, ENTXT, VEN: 电子烟, 气溶胶, 雾化, 加热, 多孔, 导液, 吸液, 导电, 引线, electrical, electronic, smoking, tobacco, cigar+, aerosol, atomiz+, heat+, porous, liquid, solution, guid+, suck+, imbib+, electric conduct +, lead wire

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 113892696 A (SHENZHEN SMOORE TECHNOLOGY LIMITED) 07 January 2022 (2022-01-07) description, paragraphs 33-53, and figures 3-7	1-16
Y	CN 114259085 A (SHENZHEN SMISS TECHNOLOGY CO., LTD.) 01 April 2022 (2022-04-01) description, paragraphs 35-52, and figures 1-4	1-16
Y	CN 114391675 A (HAINAN MOER BROTHERS TECHNOLOGY CO., LTD.) 26 April 2022 (2022-04-26) description, paragraphs 40-74, and figures 2-4	1-16
A	CN 212590295 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 26 February 2021 (2021-02-26) entire document	1-16
A	CN 215775516 U (HAINAN MOER BROTHERS TECHNOLOGY CO., LTD.) 11 February 2022 (2022-02-11) entire document	1-16



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"D" document cited by the applicant in the international application	"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
"E" earlier application or patent but published on or after the international filing date	"&" document member of the same patent family
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

11 June 2023

Date of mailing of the international search report

12 June 2023

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
CN)
China No. 6, Xitucheng Road, Jimenqiao, Haidian District,
Beijing 100088

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No. PCT/CN2023/090263

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 2022110370 A1 (SHENZHEN SMOORE TECHNOLOGY LIMITED) 14 April 2022 (2022-04-14) entire document	1-16
A	WO 2021254401 A1 (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 23 December 2021 (2021-12-23) entire document	1-16

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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CN 114391675 A	26 April 2022	None	
CN 212590295 U	26 February 2021	None	
CN 215775516 U	11 February 2022	None	
CN 216147257 U	01 April 2022	None	
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		EP 3847914 A1	14 July 2021
		EP 3847914 A4	06 April 2022
		US 2022409832 A1	29 December 2022
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		EP 3984389 A1	20 April 2022
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Form PCT/ISA/210 (patent family annex) (July 2022)

REFERENCES CITED IN THE DESCRIPTION

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