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(54) **COMMUNICATION DEVICE AND METHOD FOR RECEIVING AND TRANSMITTING SIGNAL THEREOF, AND SWITCHING CIRCUIT**

(57) The present application discloses a heating assembly and an aerosol generating device. The heating assembly comprises a heating body, a conductive first electrode, and a conductive second electrode. The heating body is configured to accommodate and heat an aerosol generating substrate when being electrified; the first electrode is arranged on the inner side surface of the heating body, and the first electrode has a first connecting part; the second electrode and the first electrode are ar-

ranged on the inner side surface of the heating body at intervals, the second electrode has a second connecting part, and the first connecting part and the second connecting part are located at the same end of the heating body and configured to connect to a power supply assembly. By means of the heating assembly and the aerosol generating device, a wiring path of a wire is greatly simplified, the length of the wire is shortened, and the manufacturing cost and difficulty are effectively reduced.

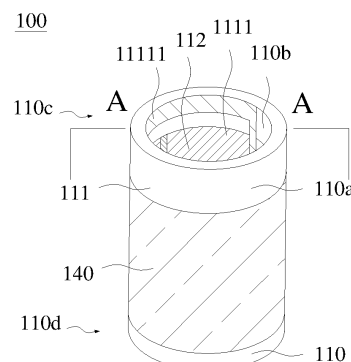


FIG. 1

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Description

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] The present application claims priority to Chinese patent application No. 2021108410964 filed on July 23, 2021, which is herein incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to the technical field of electronic atomizing devices, and in particular to a heating assembly and an aerosol-generating device.

BACKGROUND

[0003] A heat-not-burn aerosol-generating device has attracted more and more attention and favor due to its advantages such as safety, convenience, health, environmental protection, and the like.

[0004] An existing heat-not-burn aerosol-generating device generally includes a heating assembly to heat an aerosol-forming substrate to form aerosol when the heating assembly is energized. The heating assembly is specifically provided with a first electrode and a second electrode, the first electrode is configured to connect with an electrode lead, and the second electrode is configured to connect with a negative electrode lead. Therefore, the first electrode and the second electrode are connected to a power supply through the positive electrode lead and the negative electrode lead, such that the power supply supplies power to the heating assembly.

[0005] However, when using the existing heating assembly, a wiring path of the positive electrode lead and/or the negative electrode lead is relatively complex, and its production cost is high and production process is difficult.

SUMMARY OF THE DISCLOSURE

[0006] A heating assembly and an aerosol-generating device are provided by the present disclosure. The heating assembly is able to solve the problem of complex wiring path, high production cost, and high difficulty of production process of a positive electrode lead, and/or a negative electrode lead of an existing heating assembly.

[0007] In order to solve the problem, a technical solution provided by the present disclosure is a heating assembly. The heating assembly includes a heating element, a conductive first electrode and a conductive second electrode. The heating element is configured to receive an aerosol-forming substrate and heat the aerosol-forming substrate when energized. The conductive first electrode is arranged on an inner surface of the heating element, and the first electrode comprises a first connecting portion. The conductive second electrode is spaced apart from the first electrode and arranged on

the inner surface of the heating element. The second electrode includes a second connecting portion, and the first connecting portion and the second connecting portion are located at the same end of the heating element and configured to connect to a power supply assembly.

[0008] In some embodiments, the heating element includes a base and an infrared heating layer. The base has a receiving cavity with an opening at one end, the receiving cavity is configured to receive the aerosol-forming substrate from the opening, and the first electrode and the second electrode are both arranged on the inner surface of the receiving cavity. The infrared heating layer is arranged on an inner surface of the base and connected to the first electrode and the second electrode respectively. The infrared heating layer is configured to emit infrared waves when energized to heat the aerosol-forming substrate. The heating assembly also includes an infrared reflective layer. The infrared reflective layer is arranged on an outer side of the base to reflect the infrared waves emitted by the infrared heating layer.

[0009] In some embodiments, the heating element includes a plurality of sub-heating bodies, and an inner surface of each sub-heating element is provided with a first sub-connecting portion and/or a second sub-connecting portion. The first sub-connecting portions on the plurality of sub-heating bodies form the first connecting portion, and the second sub-connecting portions on the plurality of sub-heating bodies form the second connecting portion.

[0010] In some embodiments, the first sub-connecting portion and the second sub-connecting portion are arranged on the inner surface of each sub-heating element, and the first sub-connecting portion and the second sub-connecting portion of the same sub-heating element are electrically connected to the infrared heating layer of the sub-heating element through extending parts respectively, such that the infrared heating layer of each sub-heating element is able to work independently.

[0011] In some embodiments, the heating element includes a first sub-heating element and a second sub-heating element, and each of an inner surface of the first sub-heating element and an inner surface of the second sub-heating element is provided with the first sub-connecting portion, the second sub-connecting portion, a first extending part and two second sub-extending parts. The two second sub-extending parts oppositely arranged at the first sub-heating element and the second sub-heating element form a second extending part, and a heating area is formed between the adjacent first extending part and the second sub-extending part, such that each of the first sub-heating element and the second heating element is able to heat the aerosol-generating substrate when energized.

[0012] In some embodiments, each of the inner surface of the first sub-heating element and the inner surface of the second sub-heating element is provided with a third sub-connecting portion, and the third sub-connecting portion connects the two second sub-extending parts of

the same sub-heating element. The heating assembly further includes a first conductive elastic piece and a second conductive elastic piece. The first conductive elastic piece is disposed on the inner surface of the heating element and electrically connected to the first sub-connecting portion on each sub-heating element. The second conductive elastic piece is disposed on the inner surface of the heating element and electrically connected to the second sub-connecting portion on each sub-heating element.

[0013] In some embodiments, the heating assembly further includes a fixing mechanism sleeved on the outer side wall of the heating element for fixing the plurality of sub-heating bodies to form the heating element. The fixing mechanism includes a first fixing member and a second fixing member. The first fixing member is sleeved on first ends of the plurality of heating bodies and configured to fix the first ends of the plurality of sub-heating bodies. The second fixing member is sleeved on second ends of the plurality of sub-heating bodies, and configured to fix the second ends of the plurality of sub-heating bodies.

[0014] In some embodiments, the first connecting portion extends along the circumferential direction of the heating element and has a notch.

[0015] In some embodiments, the second connecting portion is located at the notch and the height of the second connecting portion along the axial direction of the heating element is consistent with the height of the first connecting portion.

[0016] In some embodiments, the heating element has a first end and a second end opposite to each other, and the first connecting portion and the second connecting portion are both arranged at the first end of the heating element. The first electrode further includes at least one first extending part connected to the first connecting portion, and the first extending part extends from the first connecting portion toward the second end of the heating element. The second electrode further includes at least one second extending part connected to the second connecting portion, and the second extending part extends from the second connecting portion toward the second end of the heating element. A heating area is formed between the adjacent first extending part and the second extending part.

[0017] In some embodiments, the first extending part and/or the second extending part extend along the axial direction of the heating element and are linear.

[0018] In some embodiments, one first extending part and one second extending part are spaced apart, or a plurality of first extending parts and a plurality of second extending parts are alternately spaced apart, so as to divide the heating element to form an even number of heating areas.

[0019] In some embodiments, the distance between any adjacent first extending part and the second extending part is the same.

[0020] In some embodiments, the first extending part and the second extending part extend along the circum-

ferential direction of the heating element and are in the spiral shape; and the heating area is located on one first extending part and one second extending part and is in the spiral shape.

[0021] In some embodiments, extending directions of the first extending part and the second extending part are consistent.

[0022] In some embodiments, the second electrode further includes a third connecting portion for connecting with a negative electrode lead, and the third connecting portion is arranged at the second end of the heating element and connected to the at least one second extending part.

[0023] In some embodiments, both of the first connecting portion and the second connecting portion are spaced apart from the infrared heating layer of the heating element.

[0024] In some embodiments, all of the first connecting portion, the second connecting portion and the third connecting portion are spaced apart from the infrared heating layer of the heating element.

[0025] In some embodiments, the heating element further includes a limiting member. The limiting member is arranged at the base. The limiting member is configured to limit the aerosol-forming substrate, so as to form a gap between an outer surface of the aerosol-forming substrate and an inner surface of the receiving cavity. The limiting member defines a limiting opening, and the limiting opening is in communication with the receiving cavity. The diameter of the limiting opening is smaller than the inner diameter of the receiving cavity; and the aerosol-forming substrate is received in the receiving cavity through the limiting opening.

[0026] In order to solve the above problem, another technical solution provided by the present disclosure is an aerosol generating device. The aerosol generating device includes a heating assembly and a power supply assembly. The heating assembly is configured to heat an aerosol-generating substrate when energized; and the heating assembly is the heating assembly described above. The power supply assembly is electrically connected to the heating assembly and configured to supply power to the heating assembly.

[0027] The heating assembly and aerosol-generating device are provided by the present disclosure. The heating assembly disposes the first connecting portion for connecting with the positive electrode lead and the second connecting portion for connecting with the negative electrode lead at the same end of the inner surface of the heating element, such that the positive electrode lead and the negative electrode lead may be connected at the same end, without the need for the positive electrode lead or the negative electrode lead to be further wired to the other end to connect with the corresponding electrode. It greatly simplifies the wiring path of the leads, reduces the length of the wire, and production cost and manufacturing difficulty are effectively reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] In order to more clearly illustrate the technical solutions in the embodiments of the present disclosure, the drawings needed to be used in the description of the embodiments will be briefly introduced below. Obviously, the drawings in the following description are only some embodiments of the present disclosure. For those of ordinary skill in the art, other drawings may also be obtained based on these drawings without exerting creative efforts.

FIG. 1 is a schematic structural view of an overall structure of a heating assembly provided by a first embodiment of the present disclosure.

FIG. 2 is a schematic cross-sectional structural view of the heating assembly shown in FIG. 1 along an A-A direction provided by an embodiment of the present disclosure.

FIG. 3 is a schematic structural view of the outer side wall of the heating assembly shown in FIG. 1 unfolded along its axial direction provided by an embodiment of the present disclosure.

FIG. 4 is a schematic structural view of an overall structure of a heating assembly provided by a second embodiment of the present disclosure.

FIG. 5 is a schematic cross-sectional structural view of the heating assembly shown in FIG. 4 along a B-B direction provided by an embodiment of the present disclosure.

FIG. 6 is a schematic structural view of the outer side wall of the heating assembly shown in FIG. 4 unfolded along its axial direction provided by an embodiment of the present disclosure.

FIG. 7 is a schematic cross-sectional structural view of an aerosol-generating device inserted into a heating assembly provided by an embodiment of the present disclosure.

FIG. 8 is a schematic structural view of the outer side wall of a heating assembly unfolded along its axial direction provided by a third embodiment of the present disclosure.

FIG. 9 is a schematic structural view of the outer side wall of a heating assembly unfolded along its axial direction provided by a fourth embodiment of the present disclosure.

FIG. 10 is a schematic structural view of the outer side wall of the heating assembly unfolded along its axial direction provided by a fifth embodiment of the present disclosure.

FIG. 11 is a schematic structural view of the outer side wall of the heating assembly unfolded along its axial direction provided by a sixth embodiment of the present disclosure.

FIG. 12 is a schematic structural view of an overall structure of a sub-heating element and a circuit on the sub-heating element provided by an embodiment of the present disclosure.

FIG. 13 is a schematic structural view of the outer side wall of a heating assembly unfolded along its axial direction provided by a seventh embodiment of the present disclosure.

FIG. 14 is a schematic structural view of an overall structure of a heating assembly provided by an eighth embodiment of the present disclosure.

FIG. 15 is a schematic structural view of an aerosol-generating device provided by an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0029] The technical solutions in the embodiments of the present disclosure will be clearly and completely described below with reference to the accompanying drawings in the embodiments of the present disclosure. Obviously, the described embodiments are only some of the embodiments of the present disclosure, rather than all of the embodiments. Based on the embodiments in the present disclosure, all other embodiments obtained by those of ordinary skill in the art without creative efforts fall within the protection scope of the present disclosure.

[0030] In the following description, specific details such as specific system structures, interfaces, technologies, etc. are provided for the purpose of explanation rather than limitation, so as to provide a thorough understanding of the present disclosure.

[0031] The terms "first", "second" and "third" in the present disclosure are only used for descriptive purposes and may not be understood as indicating or implying relative importance or implicitly indicating the number of indicated technical features. Thus, features defined as "first", "second", and "third" may explicitly or implicitly include at least one of the features. In the description of the present disclosure, "plurality" means at least two, such as two, three, etc., unless otherwise clearly and specifically limited. All directional indications (such as up, down, left, right, front, back...) in the embodiments of the present disclosure are only used to explain the relative positional relationship and moving conditions, etc., between components in a specific posture (as illustrated in the accompanying drawings). If the specific posture changes, the directional indication will also change accordingly. The terms "comprising" and "having" and any variations thereof in the embodiments of the present disclosure are intended to cover non-exclusive inclusion. For example, a process, method, system, product or device that includes a series of steps or units is not limited to the listed steps or units, but optionally also includes steps or units that are not listed, or optionally also includes other steps or components inherent to such processes, methods, products or devices.

[0032] Reference herein to "embodiment" means that a particular feature, structure or characteristic described in connection with the embodiment may be included in at least an embodiment of the disclosure. The appearances of recited phrases in various places in the speci-

fication are not necessarily all referring to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. Those of ordinary skill understand, both explicitly and implicitly, that the embodiments described herein may be combined with other embodiments.

[0033] The present disclosure will be described in detail below with reference to the drawings and embodiments.

[0034] As illustrated in FIG. 1, FIG. 2 and FIG. 3, FIG. 1 shows a schematic structural view of a heating assembly 100 provided by a first embodiment, FIG. 2 is a schematic cross-sectional structural view of the heating assembly 100 shown in FIG. 1 along an A-A direction, and FIG. 3 is a schematic structural view of the outer side wall of the heating assembly 100 shown in FIG. 1 unfolded along its axial direction.

[0035] The present disclosure provides a heating assembly 100, and the heating assembly 100 is configured to heat an aerosol-forming substrate contained in the heating assembly 100 when electricity is supplied. The aerosol-forming substrate may be a plant grass substrate or a paste substrate. etc., and the plant grass substrate may further add aroma components. The aerosol-forming substrate may be wrapped inside, such as aluminum foil or paper, and used together.

[0036] In some embodiments, the heating assembly 100 includes a heating element 110, a first electrode 120 and a second electrode 130.

[0037] The heating element 110 is configured to accommodate the aerosol-forming substrate, and the heating element 110 includes a heating material. The heating element 110 may not only support the aerosol-forming substrate contained within, but also generate heat when energized, and heat the aerosol-forming substrate contained within, thereby forming aerosol for a user to inhale.

[0038] The first electrode 120 is configured to connect to a positive electrode lead, and the second electrode 130 is configured to connect to a negative electrode lead, such that the heating assembly may receive power provided by an external power supply, thereby energizing the heating element 110 to generate heat. The heating element 110 has an outer surface 110a and an inner surface 110b. The conductive first electrode 120 and the conductive second electrode 130 are arranged on the inner surface 110b of the heating element 110 at intervals and are electrically connected through a conductive infrared heating layer. In other embodiments, the first electrode 120 and the second electrode 130 may also be arranged on the outer surface 110a of the heating element 110, which are not limited to being only arranged on the inner surface 110b of the heating element 110.

[0039] The first electrode 120 has a first connecting portion 121, and the first connecting portion 121 is configured to connect to the positive electrode lead. The second electrode 130 has a second connecting portion 131, and the second connecting portion 131 is configured to connect to the negative electrode lead. The first connect-

ing portion 121 and the second connecting portion 131 are spaced apart from each other and arranged at the same end of the heating element 110. The same end of the heating element 110 refers to the first end of the heating element 110 or the second end of the heating element 110. In some embodiments, referring to a plane (flat surface) which is perpendicular to the axial direction of the heating element 110 and passes through a center point of the heating element 110 as a boundary, a part of the heating element 110 located on one side of the plane is the first end 110c of the heating element 110, and a part of the heating element 110 located on another side of the plane is the second end 110d of the heating element 110. In some embodiments, the heating element 110 is in a shape of a hollow column and has the first end 110c and the second end 110d opposite to each other. The first connecting portion 121 and the second connecting portion 131 are spaced apart from each other and arranged at the first end 110c of the heating element 110. Therefore, both the positive electrode lead and the negative electrode lead may be connected to the first connecting portion 121 and the second connecting portion 131 respectively at the same end of the heating element 110. In other embodiments, the first connecting portion 121 may be connected to the negative electrode lead, and the second connecting portion 131 may be connected to the positive electrode lead.

[0040] Each of the first electrode 120 and the second electrode 130 may be a conductive coating coated on the inner surface 110b of the heating element 110. The conductive coating may be a metal coating, a conductive silver paste, a conductive tape, etc., or may be a metal conductive sheet, such as gold film, aluminum film or copper film, arranged on the inner surface 110b of the heating element 110 or a metal deposited on the outer surface 110a of the heating element 110.

[0041] The heating assembly 100 disposes the first connecting portion 121 for connecting with the positive electrode lead and the second connecting portion 131 for connecting with the negative electrode lead at the same end of the inner surface 110b of the heating element 110, such that the positive electrode lead and the negative electrode lead may be connected at the same end, without the need for the positive electrode lead or the negative electrode lead to be further wired to the other end to connect with the corresponding electrode. Compared with the solution of arranging the first connecting portion 121 and the second connecting portion 131 at opposite ends of the heating element 110 such that the positive electrode lead and the negative electrode lead need to be connected at both ends, it not only greatly simplifies the wiring path of the leads, but also reduces the length of the wire, and production cost and manufacturing difficulty are effectively reduced.

[0042] The heating element 110 may be entirely made of a conductive material, such as conductive ceramics, or may include an insulating base and a conductive infrared heating layer disposed on a surface of the insulat-

ing base. In an embodiment, the heating element 110 includes a base 111 and an infrared heating layer 112.

[0043] The base 111 has a receiving cavity 1111 with an opening 11111 at one end, and the receiving cavity 1111 is configured to receive the aerosol-forming substrate from the opening 11111. In some embodiments, the caliber of the opening 11111 may be greater than or corresponding to the outer diameter of the aerosol-forming substrate, and the inner diameter of the receiving cavity 1111 may also be greater than or corresponding to the outer diameter of the aerosol-forming substrate, such that the aerosol-forming substrate may be inserted through the opening 11111 or withdrawn from the interior of the receiving cavity 1111. In addition, in an embodiment, there may be a certain gap between the outer side wall of the aerosol-forming substrate and the inner wall of the receiving cavity 1111, such that the aerosol-forming substrate may be inserted into or withdrawn from the receiving cavity 1111 more easily.

[0044] Further, in an embodiment, the caliber of the opening 11111 may be consistent with the inner diameter of the receiving cavity 1111. In another embodiment, the caliber of the opening 11111 may be smaller than the inner diameter of the receiving cavity 1111, and the central axis of the opening 11111 coincides with the central axis of the receiving cavity 1111, such that when the aerosol-forming substrate is contained in the receiving cavity 1111 through the opening 11111, the aerosol-forming substrate is spaced apart from the inner wall of the receiving cavity 1111 to prevent the aerosol-forming substrate from scraping the inner wall of the receiving cavity 1111 and causing damage to the first electrode 120 and/or the second electrode 130.

[0045] The base 111 may be in the shape of a hollow tube. Further, in the first embodiment, the base 111 is in the shape of a hollow cylinder, and the receiving cavity 1111 is in the shape of a cylinder. The wall thickness of the side wall of the base 111 is a fixed value, such that the heating element 110 may evenly heat the aerosol-forming substrate. The first connecting portion 121 and the second connecting portion 131 both extend in an arc shape along the circumferential direction of the base 111. In some embodiments, the first connecting portion 121 and the second connecting portion 131 have the same length and are located axially along the base 111 at the same height.

[0046] The first electrode 120 and the second electrode 130 are arranged on the inner surface 110b of the base 111. The base 111 has the first end 110c and the second end 110d opposite to each other. The first connecting portion 121 and the second connecting portion 131 are spaced apart and arranged at the same end of the inner surface 110b of the receiving cavity 1111. The base 111 may be made of a high-temperature resistant insulating material such as quartz glass, ceramics or mica to prevent the first electrode 120 and the second electrode 130 from being short-circuited. When the base is quartz glass, quartz glass with a transparency of 80% or

above may be adopted.

[0047] The infrared heating layer 112 may emit infrared waves when energized to heat the aerosol-forming substrate. In some embodiments, the infrared heating layer 112 may be arranged around the inner surface 110b of the receiving cavity 1111 and connected to the first electrode 120 and the second electrode 130 respectively. After the first electrode 120 and the second electrode 130 are energized, a current passes through the infrared heating layer 112 between the first electrode 120 and the second electrode 130, thereby emitting the infrared waves. The infrared heating layer 112 may be a metal layer, a conductive ceramic layer or a conductive carbon layer. The shape of the infrared heating layer 112 may be a continuous film, a porous mesh or a strip. The material, shape and size of the infrared heating layer 112 may be arranged as needed.

[0048] The infrared heating layer 112 is disposed on the inner surface 110b of the base 111. Compared with the solution in which the infrared heating layer 112 is disposed on the outer surface 110a of the base 111, the distance between the infrared heating layer 112 and the aerosol-forming substrate is closer, and the infrared waves emitted by the heating layer 112 may directly heat the aerosol-forming substrate without being transmitted through a side wall of the base 111, thereby effectively avoiding the problem of heat loss caused by the infrared waves being transmitted through the side wall of the base 111, thereby effectively improving heat transfer efficiency to the aerosol-forming substrate generated by the infrared heating layer 112.

[0049] In an embodiment, the infrared heating layer 112 may be an infrared heating film. When the infrared heating film is energized, it radiates infrared rays to heat the aerosol-forming substrate in the receiving cavity 1111. When the infrared heating film is energized, the infrared rays emitted by the infrared heating film do not need to pass through the side wall of the base 111 and may directly heat the aerosol-forming substrate in the receiving cavity 1111, thereby improving infrared radiation efficiency. The infrared heating wavelength is 2.5 μ m~20 μ m. Due to the characteristics of the aerosol-forming substrate, the heating temperature usually needs to be 350°C or above, and the extreme value of energy radiation is mainly in the 3-5 μ m band.

[0050] As part of the infrared rays emitted by the infrared heating film is emitted toward the outside of the base 111, the infrared waves emitted by the infrared heating film are not able to be fully utilized. In order to solve this problem, in an embodiment, the heating assembly 100 also includes an infrared reflective layer 140. The infrared reflective layer 140 is arranged on the outer surface 110a of the base 111 to reflect the infrared rays emitted by the infrared heating film. In some embodiments, the infrared reflective layer 140 is configured to reflect the infrared rays emitted by the infrared heating film toward the outside of the base 111, such that the infrared rays may be reflected back into the interior of the base 111 and heat

the aerosol-forming substrate by infrared radiation, thereby effectively improving the heating efficiency of the infrared heating film.

[0051] In an embodiment, the infrared reflective layer 140 may be disposed on the entire outer surface 110a of the base 111, or on a part of the outer surface 110a of the base 111. In an embodiment, at least a part of the infrared reflective layer 140 is positioned relative to the infrared heating film to reflect the infrared rays emitted by the infrared heating film.

[0052] In some embodiments, the infrared reflective layer 140 may be a high temperature resistant infrared reflective film, and the infrared reflective film is coated on the outer surface 110a of the base 111.

[0053] As illustrated in FIG. 4, FIG. 5 and FIG. 6, FIG. 4 is a schematic structural view of a heating assembly 100 provided by a second embodiment, FIG. 5 is a schematic cross-sectional structural view of the heating assembly 100 shown in FIG. 4 along a B-B direction, and FIG. 6 is a schematic structural view of the outer side wall of the heating assembly 100 shown in FIG. 4 expanded along its axial direction.

[0054] In an embodiment, the heating element 110 may also include a limiting member 113. The limiting member 113 is arranged at the base 111 and is configured to limit displacement of the aerosol-forming substrate in the radial direction, such that there is a gap formed between the outer surface 110a of the aerosol-forming substrate and the inner surface 110b of the receiving cavity 1111 during the process of the aerosol-forming substrate of being inserted into the receiving cavity 1111. Therefore, an airway is formed between the aerosol-forming substrate and the receiving cavity 1111, which facilitates the adjustment of suction resistance of the aerosol-forming substrate.

[0055] In an embodiment, the limiting member 113 may be arranged at one end of the base 111 with the opening 11111, and defines a limiting opening 1131. The limiting opening 1131 is in communication with the receiving cavity 1111, and the caliber of the limiting opening 1131 is smaller than the inner diameter of the receiving cavity 1111. The aerosol-forming substrate is received in the receiving cavity 1111 through the limiting opening 1131, such that when the aerosol-forming substrate is limited to the receiving cavity 1111 through the limiting opening 1131, there is a gap between the inner surface 110b of the receiving cavity 1111 and the outer surface 110a of the aerosol-forming substrate. Therefore, an airway is formed between the aerosol-forming substrate and the receiving cavity 1111, which facilitates the adjustment of the suction resistance of the aerosol-forming substrate.

[0056] In the present embodiment, the caliber of the limiting opening 1131 may be greater than the outer diameter of the aerosol-forming substrate, such that the aerosol-forming substrate may be smoothly inserted into or withdraw from the receiving cavity 1111 through the limiting opening 1131.

[0057] In some embodiments, the limiting member 113

and the base 111 may be made of the same material and integrally formed to simplify the manufacturing process of the heating element 110. The limiting member 113 and the base 111 may also be made of different materials.

[0058] In an embodiment, the axis of the limiting opening 1131 is located on the same straight line as the axis of the receiving cavity 1111, such that when the limiting opening 1131 limits the radial direction of the aerosol-forming substrate in the receiving cavity 1111, the distance between the outer side wall of the aerosol-forming substrate and the inner surface wall of the receiving cavity 1111 is equal everywhere. Therefore, the infrared heating layer 112 on the inner wall of the receiving cavity 1111 evenly heats the aerosol-forming substrate in the circumferential direction, which facilitates to uniform heat distribution during the heating process of the aerosol-forming substrate.

[0059] In an embodiment, as illustrated in FIG. 7, FIG. 7 is a schematic cross-sectional structural view of an aerosol-forming substrate inserted into a heating assembly 100. The limiting member 113 is arranged at an end surface of the base 111 with an opening 11111. In the present embodiment, the limiting opening 1131 formed by the limiting member 113 is different from the opening 11111 of the receiving cavity 1111, and may be located above the opening 11111 of the receiving cavity 1111. During the process of inserting the aerosol-forming substrate into the receiving cavity 1111, the aerosol-forming substrate enters the receiving cavity 1111 through the limiting opening 1131 and the opening 11111 of the receiving cavity 1111 in sequence. In the present embodiment, the limiting member 113 may also extend obliquely toward the receiving cavity 1111 to define the limiting opening 1131 at the opening 11111 of the receiving cavity. In the present embodiment, the limiting member 113 is the opening 1131 of the receiving cavity 1111.

[0060] In another embodiment, as illustrated in FIG. 4 and FIG. 5, the limiting member 113 may be arranged on the inner surface 110b of the receiving cavity 1111 and located at an end of the receiving cavity 1111. In the present embodiment, an upper end surface of limiting member 113 may be flush with an upper end surface of the side wall of the base 111 and define the opening 11111 of the receiving cavity 1111. In the present embodiment, the opening 11111 and the limiting opening 1131 are located on the same plane. The limiting opening 1131 defined by the limiting member 113 is the opening 11111 of the receiving cavity 1111.

[0061] In an embodiment, the limiting member 113 may be a protruding ring extending along the circumferential direction of the receiving cavity 1111. As illustrated in FIG. 4, the convex ring may be disposed on the inner wall surface of the receiving cavity 1111 and arranged in a circle around the inner wall surface of the receiving cavity 1111. In the present embodiment, a hollow area of the convex ring away from the inner wall surface of the receiving cavity 1111 is formed as the limiting opening 1131.

[0062] In another embodiment, the limiting member 113 may include a plurality of bumps arranged at intervals along the circumferential direction of the receiving cavity 1111. In some embodiments, the plurality of bumps may be arranged on the base 111 at equal intervals along the circumferential direction of the receiving cavity 1111, such that the limiting member 113 may effectively limit the aerosol-forming substrate in multiple radial directions. Further, the heights of the plurality of protrusions in the axial direction of the receiving cavity 1111 are equal, so as to form the limiting opening 1131 at the same axial height of the receiving cavity 1111.

[0063] In some embodiments, the shape of the above-mentioned limiting member 113 may be annular, arc-shaped, point-shaped, block-shaped, strip-shaped, etc. For example, two arc-shaped strips may be disposed at equal intervals on the inner surface 110b of the receiving cavity 1111; or, three block-shaped structures may be disposed at equal intervals on an end surface of the first end 110c of the base 111 and forms the limiting opening 1131 at the first end 110c of the base 111. The number, shape, structure and location of the limiting member 113 are not limited to the above-mentioned ways.

[0064] For example, when the number of the limiting member 113 is multiple, all of the multiple limiting members 113 may be arranged at one end of the base 111, or they may be respectively arranged at two opposite ends of the base 111, or, the multiple limiting members 113 may be distributed inside the receiving cavity 1111 along the axial direction. For example, the number of the limiting member 113 may be two, one of the limiting members 113 is arranged at the first end 110c of the base 111, and the other limiting member 113 is arranged at the second end 110d of the base 111, such that the two limiting openings 1131 are formed at both ends. Therefore, both opposite ends of the aerosol-forming substrate may be limited by the limiting members 113.

[0065] A circuit on the inner wall of the receiving cavity 1111 may be designed in various forms as needed. In an embodiment, as illustrated in FIG. 8, which is a schematic structural view of the outer side wall of a heating assembly 100 unfolded along its axial direction provided by a third embodiment. The first connecting portion 121 is annular, extends along the circumferential direction of the heating element 110 and has a notch 1211. In other words, the first connecting portion 121 does not form a closed loop in the circumferential direction. The second connecting portion 131 is located at a position of the first connecting portion 121 away from an end surface of the first end 110c, such that the negative electrode lead may be connected to the second connecting portion 131 through the notch 1211. The first connecting portion 121 forms the notch 1211 such that the negative electrode lead does not contact the first connecting portion 121 and is connected to the second connecting portion 131. Thus, it prevents the negative electrode lead from contacting the first connecting portion 121, which results in short circuiting, and facilitates wiring.

[0066] FIG. 8 shows three longitudinal positional relationships between the first connecting portion 121 and the second connecting portion 131. When the second electrode 130 is at position a, the second connecting portion 131 is completely staggered with the notch 1211 along the axial direction of the heating element 110. When the second electrode 130 is at position b, the second connecting portion 131 and the notch 1211 are arranged facing each other in the axial direction of the heating element 110. When the second electrode 130 is at position c, the second connecting portion 131 is partially staggered with the notch 1211 along the axial direction of the heating element 110. When the second electrode 130 is disposed at position b, the wiring is more easily connected to the second connecting portion 131 through the notch 1211, and the wiring path of the wire is simpler.

[0067] In an embodiment, as illustrated in FIG. 3, both the first connecting portion 121 and the second connecting portion 131 may be regarded as circular rings with notches. One of the first connecting portion 121 and the second connecting portion 131 is arranged at the notch of the other of the first connecting portion 121 and the second connecting portion 131. For example, the entire second connecting portion 131 is exposed through the notch 1211 along the axial direction of the heating element 110, the second connecting portion 131 is located at the position of the notch 1211, and its height is consistent with that of the first connecting portion 121 in the axial direction of the heating element 110. Further, the first connecting portion 121 and the second connecting portion 131 are flush with an end surface of the first end 110c of the heating element 110. Therefore, the positive electrode lead and the negative electrode lead may be directly connected to the first connecting portion 121 and the second connecting portion 131. Thus, the wiring path of the wires is simpler, and the wiring method of the heating assembly 100 is simplified.

[0068] In an embodiment, as illustrated in FIG. 3, the first electrode 120 further includes at least one first extending part 122. One end of the first extending part 122 is connected to the first connecting portion 121, and another end of the first extending part 122 extend from the first connecting portion 121 toward the second end 110d of the heating element 110. The second electrode 130 further includes at least one second extending part 132. One end of the second extending part 132 is connected to the second connecting portion 131, and another end extends from the second connecting portion 131 toward the second end 110 d of the heating element 110. The first extending part 122 and the second extending part 132 may extend to a position close to the second end 110d, or may extend to an end surface of the second end 110d. The first extending part 122 and the second extending part 132 are configured to form or define at least one heating area on the infrared heating layer 112. The first extending part 122 and the second extending part 132 are spaced apart, and the infrared heating layer 112 between the adjacent first extending part 122 and the

second extending part 132 forms a heating area. After the first electrode 120 and the second electrode 130 are energized, current passes through the heating area between the first extending part 122 and the second extending part 132, and the heating area generates heat to heat the aerosol-forming substrate. The first connecting portion 121 and the first extending part 122 may be made of the same material and integrated together by printing or deposition. The second connecting portion 131 and the second extending part 132 may be made of the same material and integrated together by printing or deposition. In the present disclosure, the difference between the connecting portion and the extending part is that the connecting portion may be larger in size than the extending part, so as to facilitate welding or bonding with external wires.

[0069] An extending path of the first extending part 122 and the second extending part 132 may be a straight line, a polygonal line, a curve or an irregular shape. An extending direction of the first extending part 122 or the second extending part 132 may be along the axial direction, and may also extend at any angle to the axial direction, or spirally extend along the circumferential direction.

[0070] In an embodiment, the first extending part 122 and the second extending part 132 are parallel, both extend along the axial direction of the heating element 110, and both are linear. Thus, the shape of the heating area between of the first extending part 122 and the second extending part 132 is regular, which facilitates to uniform current distribution between the first extending part 122 and the second extending part 132, thereby making each heating area evenly heat the aerosol-forming substrate.

[0071] In the first embodiment, the first connecting portion 121 and the second connecting portion 131 are evenly distributed circumferentially on the first end 110c of the base 111. A number of each of the first extending part 122 and the second extending part 132 may be one. One end of the first extending part 122 is located in the middle of the first connecting portion 121, and another end extends to an end surface of the second end 110d of the base 111. One end of the second extending part 132 is located in the middle of the second connecting portion 131, and another end extends to an end surface of the second end 110d of the base 111. The first extending part 122 and the second extending part 132 are spaced apart and arranged at opposite ends of the same radial direction of the cylindrical base 111, both extend along the axial direction of the heating element 110, and both may be linear. In other embodiments, the first extending part 122 and/or the second extending part 132 may also be curved, as long as they do not intersect, the present disclosure does not limit this. In some embodiments, the first extending part 122 and the second extending part 132 may be evenly distributed along the circumferential direction and divide the infrared heating layer 112 into two heating areas with the same shape and size, such that the two heating areas may evenly heat the aerosol-forming substrate. After the first electrode 120 and the

second electrode 130 are energized, the current flows from the first extending part 122 to the second extending part 132 in two opposite directions. The current flows through the two heating areas. The two heating areas generate heat and heat the aerosol-forming substrate. The circuit distribution of this heating assembly is simple, and the wiring appearing at the same end is realized, making the wiring path of the heating assembly relatively simple and reducing the production cost and difficulty.

[0072] In an embodiment, as illustrated in FIG. 9, which is a schematic structural view of the outer side wall of a heating assembly 100 unfolded along its axial direction provided by a fourth embodiment. The second electrode 130 also includes a third connecting portion 133, and third connecting portion 133 is configured to connect to the negative electrode lead. The third connecting portion 133 is arranged at the second end 110d of the heating element 110 and is connected to the second extending part 132. The third connecting portion 133 may extend circumferentially along the second end 110d of the heating element 110 to form a closed ring shape, a ring shape with a notch, or an arc shape. During wiring, the positive electrode lead is connected to the first connecting portion 121 on the first end 110c, and the negative electrode lead may be connected to the second connecting portion 131 on the first end 110c or the third connecting portion 133 on the second end 110d. Therefore, the arranging of the third connecting portion 133 enables the heating assembly 100 to realize both single-side wiring and double-side wiring. The heating assembly 100 provides a variety of wiring ways, and the wiring of the heating assembly 100 may be selected as needed. In other embodiments, the first electrode 120 may also include a third connecting portion 133, and the third connecting portion 133 is configured to connect to the positive electrode lead, which may also realize the function of both single-side wiring and double-side wiring of the heating assembly.

[0073] In an embodiment, at least one of the first connecting portion 121, the second connecting portion 131 and the third connecting portion 133 is spaced apart from the infrared heating layer 112 of the heating element 110. When the infrared heating layer 112 is connected to at least one of the first connecting portion 121, the second connecting portion 131 and the third connecting portion 133, a part of the current may flow from the first connecting portion 121 to the second extending part 132, or from the first extending part 122 to the second connecting portion 131, or from the first extending part 122 to the third connecting portion 133, such that the direction of the current in the heating area is irregular and the heat in the heating area is uneven. In some embodiments, the first connecting portion 121, the second connecting portion 131 and the third connecting portion 133 are all spaced apart from the infrared heating layer 112 of the heating element 110, so as to limit the current flow direction of the heating area to be the circumferential direction, such that the current in the heating area is more uniform and the aerosol-forming substrate is heated more uniformly.

Further, an edge of the infrared heating layer 112 is flush with an end of the first extending part 122 close to the second end 110d. The first extending part 122 completely separates the infrared heating layer 112 into two spaced heating areas with the same shape and area, so as to make the current direction in the heating area more regular. When there is no third connecting portion 133, both the first connecting portion 121 and the second connecting portion 131 are spaced apart from the infrared heating layer 112 of the heating element 110, and have the same distance from the infrared heating layer 112 of the heating element 110.

[0074] In an embodiment, as illustrated in FIG. 10, which is a schematic structural view of the outer side wall of a heating assembly 100 unfolded along its axial direction provided by a fifth embodiment. The first electrode 120 includes a plurality of first extending parts 122 connected to the first connecting portion 121, and the second electrode 130 includes a plurality of second extending parts 132 connected to the second connecting portion 131. The adjacent first extending part 122 and the second extending part 132 are spaced apart, and a heating area is formed between the adjacent first extending part 122 and the second extending part 132. Further, the plurality of first extending parts 122 and the plurality of second extending parts 132 are alternately arranged to circumferentially separate the infrared heating layer 112 to form an even number of heating areas, with each heating area having a part of the infrared heating layer 112.

[0075] When the number of the first extending parts 122 and the number of the second extending parts 132 is the same, the first extending parts 122 and the second extending parts 132 are alternately arranged at intervals, such that the infrared heating layer 112 may be fully utilized and divided into an even number of heating areas, so as to heat the aerosol-forming substrate. When the number of the first extending parts 122 and the number of the second extending parts 132 are different, there will be a situation where two first extending parts 122 are adjacent or two second extending parts 132 are adjacent. The electrodes of the two adjacent second extending parts 122 have the same polarity, and the electrodes of the two adjacent second extending parts 132 have the same polarity. Current is not able to be conducted between them. In other words, the two adjacent first extending parts 122 or the two adjacent second extending parts 132 is not able to form a heating area, and the infrared heating layer 112 is not able to be fully utilized. Therefore, when the number of the first extending parts 122 and the number of the second extending parts 132 is the same, the first extending parts 122 and the second extending parts 132 are alternately arranged at intervals, such that the infrared heating layer 112 is able to be fully utilized, and a situation where a heating area is not able to be formed by a part of the infrared heating layer 112 may be avoided.

[0076] Further, the distance between any adjacent first extending part 122 and second extending part 132 is the

same, and the first extending parts 122 and the second extending parts 132 extend along the axial direction and are linear, such that the plurality of first extending parts 122 and the plurality of second extending parts 132 are linearly spaced and evenly distributed circumferentially on the outer surface 110a of the heating element 110. The shape and size of the heating area between adjacent first extending part 122 and second extending part 132 are the same, and the equivalent resistance of each heating area is the same. Therefore, an amount of heat emitted by each heating area may be basically the same after being energized, and each heating area may evenly heat the aerosol-forming substrate in all directions.

[0077] When there are a plurality of first extending parts 122 and a plurality of second extending parts 132, the second electrode 130 includes a third connecting portion 133. The first connecting portion 121 is configured to connect to the positive electrode lead and also to connect the plurality of first extending parts 122. The third connecting portion 133 is configured to connect to the negative electrode lead and to connect the plurality of second extending parts 132. In other words, the first electrode 120 and the second electrode 130 form a toothed electrode. In some embodiments, the third connecting portion 133 is connected to each second extending part 132, and the third connecting portion 133 forms a ring shape at the second end 110d of the heating element, such that each heating area may be powered on.

[0078] In the fifth embodiment, the number of both the first extending part 122 and the second extending part 132 is two. The two first extending parts 122 are respectively located at two ends of the first connecting portion 121. One second extending part 132 is connected to the second connecting portion 131 and the third connecting portion 133 respectively, and the other second extending part 132 is provided between the two first extending parts 122 and is only connected to the third connecting portion 133. The third connecting portion 133 is annularly arranged at the second end 110d of the heating element 110 and is connected to the two second extending parts 132 respectively. The two first extending parts 122 and the two second extending parts 132 are alternately arranged at intervals, both extend along the axial direction of the heating element 110, and both are linear. The two first extending parts 122 and the two second extending parts 132 are evenly distributed along the circumferential direction, and divide the infrared heating layer 112 into four heating areas with the same shape and size, such that the four heating areas may evenly heat the aerosol-forming substrate. Compared with the heating assembly 100 in which the circuit separates the infrared heating layer 112 into two heating areas, the equivalent resistance of each heating area in the heating assembly 100 with four heating areas is smaller, the heating power of each heating area is larger, and the heating assembly 100 is more efficient in heating the aerosol-forming substrate.

[0079] As illustrated in FIG. 11, which is a schematic

structural view of the outer side wall of the heating assembly 100 unfolded along its axial direction provided by a sixth embodiment. In the sixth embodiment, the number of both the first extending part 122 and the second extending part 132 is one. The first extending part 122, the second extending part 132 and the infrared heating layer 112 all extend spirally along the circumferential direction of the heating element 110 and extend from the first end 110c to the second end 110d of the heating element 110.

[0080] As first extending part 122, the second extending part 132 spirally extend from the first end 110c of the heating element 110 to the second end 110d of the heating element 110, both ends of the first extending part 122 may be served as the first connecting portion 121, and two ends of the second extending part 132 may be served as the second connecting portion 131. Alternatively, the first connecting portion 121 and the second connecting portion 131 are arranged at both the first end 110c and the second end 110d, and the first connecting portion 121 is connected to one end of the first extending part 122, and the second connecting portion 131 is connected to one end of the extending 132.

[0081] The infrared heating layer 112 is located between the first extending part 122 and the second extending part 132 and forms a spiral heating area. In some embodiments, the spiral extending direction of the first extending part 122 and that of the second extending part 132 are consistent, and a separation distance between the first extending part 122 and the second extending part 132 is equal everywhere. The first extending part 122 and the second extending part 132 are evenly distributed on the outer surface 110a of the heating element 110, such that the infrared heating layer 112 may evenly heat the aerosol-forming substrate.

[0082] In an embodiment, as illustrated in FIG. 12 and FIG. 13, the heating element 110 includes a plurality of sub-heating bodies 114, and the plurality of sub-heating bodies 114 may be joined together to form one heating element 110. Electrodes are arranged on the inner surfaces 110b of the plurality of sub-heating bodies 114. After the plurality of sub-heating bodies 114 are joined, the electrodes of the plurality of sub-heating bodies 114 may be joined into a circuit of the heating element 110. The heating element 110 may include the plurality of sub-heating bodies 114 with equal size and the same shape, or may include the plurality of sub-heating bodies 114 with different sizes and shapes. When the heating element 110 is a hollow cylinder, the plurality of sub-heating bodies 114 may be in the shape of a plurality of hollow arcs. FIG. 11 is a schematic structural view of a sub-heating element 114. In the present embodiment, the sub-heating element 114 is in the shape of a hollow semi-cylinder, and two hollow semi-cylindrical sub-heating bodies 114 may be joined into a complete hollow cylindrical heating element 110.

[0083] In the present disclosure, as the first electrode 120, the second electrode 130 and the infrared heating layer 112 are all disposed on the inner surface 110b of

the base 111, it is inconvenient to coat the electrodes and the infrared heating layer 112 in the receiving cavity 1111 from outside during the manufacturing process of the heating assembly. Therefore, the heating element 110 needs to be divided into the plurality of sub-heating bodies 114, the electrodes and the infrared heating layer 112 are coated on each of the sub-heating bodies 114, and finally the various sub-heating bodies 114 are joined into a complete heating element 110.

[0084] In some embodiments, the inner surface 110b of each sub-heating element 114 is provided with a first sub-connecting portion 123 and/or a second sub-connecting portion 134. The first sub-connecting portions 123 on the plurality of sub-heating bodies 114 are joined to form the first connecting portion 121. The second sub-connecting portions 134 on the plurality of sub-heating bodies 114 are joined to form the second connecting portion 131. In some embodiments, the inner surface 110b of each sub-heating element 114 is provided with the first sub-connecting portion 123 and the second sub-connecting portion 134, and the first sub-connecting portion 123 and the second sub-connecting portion 134 of the same sub-heating element 114 is electrically connected to the infrared heating layer 112 of the sub-heating element 114 through the extending part respectively, such that the infrared heating layer 112 of each sub-heating element 114 may work independently. In other words, the plurality of sub-heating bodies 114 may not only be joined together to generate heat for the aerosol-forming substrate as a whole, but may also act as an independent heating element 110 without being joined, and each may be energized to generate heat for the aerosol-forming substrate. When each of the plurality of sub-heating bodies 114 acts as an independent heating element 110 to generate heat for the aerosol-forming substrate, a plurality of pairs of positive and negative electrode leads may be configured to connect the first sub-connecting portion 123 and the second sub-connecting portion 134 of each sub-heating element 114 respectively.

[0085] As illustrated in FIG. 13, which is a schematic structural view of an unfolded outer side wall of a heating assembly unfolded formed by joining two sub-heating bodies 114 shown in FIG. 11 provided by a seventh embodiment. The heating element 110 includes a first sub-heating element 115 and a second sub-heating element 116. Both the first sub-heating element 115 and the second sub-heating element 116 are hollow semi-cylindrical. The first sub-heating element 115 and the second sub-heating element 116 may form a hollow cylindrical heating element 110 after being joined. The inner surface 110b of the first sub-heating element 115 and the inner surface 110b of the second sub-heating element 116 are both provided with a first sub-connecting portion 123, a second sub-connecting portion 134, a first extending part 122 and two second sub-extending parts 1321. The adjacent second sub-extending part 1321 on the first sub-heating element 115 and the second sub-extending part 1321 on the second sub-heating element 116 form one

second extending part 132, and the two sub-extending parts 132 on the first sub-heating element 115 and the two second sub-extending parts 1321 on the second sub-heating element 116 form two second extending parts 132. One heating area is formed between the adjacent first extending part 122 and the second sub-extending part 1321, such that both the first sub-heating element 115 and the second sub-heating element 116 may heat the aerosol-forming substrate when energized.

[0086] Further, the inner surface 110b of the first sub-heating element 115 and the inner surface 110b of the second sub-heating element 116 are both provided with a third sub-connecting portion 1331, and the third sub-connecting portion 1331 connects the two second sub-extending parts 1321 of the same second sub-heating element 114. The third sub-connecting portion 1331 on each sub-heating element 114 is joined to form the third connecting portion 133. The arranging of the third sub-connecting portion 1331 enables the circuit on each sub-heating element 114 to realize both single-side wiring and double-side wiring. The heating assembly 100 provides a variety of wiring ways, and the wiring way of the heating assembly 100 may be selected as needed.

[0087] In an embodiment, the heating assembly 100 may further include a first conductive elastic piece, a second conductive elastic piece, and a third conductive elastic piece. In some embodiments, the first conductive elastic piece, the second conductive elastic piece and the third conductive elastic piece are all disposed at a joint position of the plurality of sub-heating bodies 114.

[0088] During the joining process of the plurality of sub-heating bodies 114, the electrodes of the plurality of sub-heating bodies 114 may have poor contact. By arranging the first conductive elastic piece, the second conductive elastic piece and the third conductive elastic piece, the respective electrodes on different sub-heating bodies 114 may be connected. Therefore, the heating assembly may work normally and heat the aerosol-forming substrate.

[0089] The first conductive elastic piece is disposed on the inner surface 110b of the heating element 110 and is electrically connected to the first sub-connecting portion 123 on each sub-heating element 114. There may be a plurality of first conductive elastic pieces, and each first conductive elastic piece connects two adjacent first sub-connecting portions 123. In some embodiments, the first conductive elastic piece may be in contact with the first sub-connecting portion 123 on each sub-heating element 114, such that the first sub-connecting portion 123 on each sub-heating element 114 is electrically connected. Alternatively, the first conductive elastic piece may also be in contact with the first extending part 123 on each sub-heating element 114, such that the first sub-connecting portion 123 on each sub-heating element 114 is electrically connected.

[0090] The second conductive elastic piece is disposed on the inner surface 110b of the heating element 110 and communicates with the second sub-connecting

portion 134 on each sub-heating element 114. The number of the second conductive elastic pieces may be multiple, and each second conductive elastic piece connects two adjacent first sub-connecting portions 123. In some embodiments, the second conductive elastic piece may be in contact with the second sub-connecting portion 134 on each sub-heating element 114, such that the second sub-connecting portion 134 on each sub-heating element 114 is electrically connected. Alternatively, the first conductive elastic piece may also be in contact with the second sub-extending part 1321 on each sub-heating element 114, such that the second sub-connecting portion 134 on each sub-heating element 114 is electrically connected.

[0091] In an embodiment, the third conductive elastic piece is disposed on the inner surface 110b of the heating element 110 and is connected to the third sub-connecting portion 1331 on each sub-heating element 114, such that the second sub-connecting portion 134 on each sub-heating element 114 is connected and electrically connected. There may be a plurality of third conductive elastic pieces, and each third conductive elastic piece connects two adjacent third sub-connecting portions 1331.

[0092] In an embodiment, as illustrated in FIG. 14, FIG. 14 is a schematic structural view of a heating assembly 100 provided by an eighth embodiment. The heating assembly 100 also includes a fixing mechanism 150. The fixing mechanism 150 is sleeved on the outer side wall of the heating element 110 and is configured to fix the plurality of sub-heating bodies 114, so as to limit the position of the plurality of sub-heating bodies 114. Besides that, the fixing mechanism 150 may also enable the plurality of sub-heating bodies 114 to be joined into the heating element 110, such that the heating assembly may work normally.

[0093] In an embodiment, the fixing mechanism 150 further includes a first fixing member 151 and a second fixing member 152. The first fixing member 151 is sleeved on the first ends 110c of the plurality of sub-heating bodies 114 for fixing the first ends 110c of the plurality of sub-heating bodies 114. The second fixing member 152 is sleeved on the second ends 110d of the plurality of sub-heating bodies 114 for fixing the second ends 110d of the plurality of sub-heating bodies 114. The first fixing member 151 and the second fixing member 152 may have limiting grooves. The first ends 110c and the second ends 110d of the plurality of sub-heating bodies 114 are respectively provided in the limiting grooves of the first fixing member 151 and the second fixing member 152, so as to limit the plurality of sub-heating bodies 114.

[0094] In the eighth embodiment, as illustrated in FIG. 14, the first fixing member 151 is a cylindrical upper cover, and the second fixing member 152 is a cylindrical base. The heating element 110 includes two sub-heating bodies 114. The upper cover is sleeved on one end of the two sub-heating bodies 114, and the base is sleeved on another end of the two sub-heating bodies 114, such that the two sub-heating bodies 114 are fixed in the upper

cover and the base. Further, the upper cover and the base limit the two sub-heating bodies 114, and the two sub-heating bodies 114 are joined into one heating element 110, such that the heating element 110 may heat the aerosol-forming substrate after being energized.

[0095] In an embodiment, as illustrated in FIG. 14, the fixing mechanism 150 also has a through hole 153, and the diameter of the through hole 153 is smaller than the inner diameter of the receiving cavity 1111 of the heating element 110. In other words, the fixing mechanism 150 may also act as the limiting member 113 to limit the position of the aerosol-forming substrate in the receiving cavity 1111, such that there is a gap between the outer surface 110a of the aerosol-forming substrate and the inner surface 110b of the receiving cavity 1111. Therefore, an airway is formed between the aerosol-forming substrate and the receiving cavity 1111, which facilitates the adjustment of suction resistance of the aerosol-forming substrate.

[0096] FIG. 15 is a schematic structural view of an aerosol-generating device 200 provided by an embodiment of the present disclosure. The present disclosure also provides an aerosol-generating device 200. The aerosol-generating device 200 may include a heating assembly 100 and a power supply assembly 230.

[0097] The heating assembly 100 may specifically be the heating assembly 100 involved in any of the above embodiments. For its specific structure and function, the relevant descriptions of the heating assembly 100, which may achieve the same or similar technical effects, in the above embodiments may be referred, which will not be described again.

[0098] The aerosol-generating device 200 may further include a housing 210 and a mounting base 220. The mounting base 220 is configured to fix the heating assembly 100 on the housing 210. In some embodiments, the mounting base 220 includes a mounting body, the mounting body is provided with a through hole 153, and the heating assembly 100 is inserted into the through hole 153 to connect with the mounting base 220. In an embodiment, an escape groove may also be arranged at the side wall of the through hole 153, and the positive electrode lead and the negative electrode lead extend into the mounting base 220 through the escape groove to connect with the first electrode 120 and the second electrode 130 away from the mounting base 220 on the heating element 110. Further, the mounting body is also provided with at least two clamping parts, and the mounting base 220 is specifically fixed to the housing 210 of the aerosol-generating device through the clamping parts.

[0099] The aerosol-generating device 200 may also include a controller (not shown in the drawings). The controller is connected to the heating assembly 100 and the power supply assembly 230 respectively, and is configured to control the power supply assembly 230 to supply power to the heating assembly 100 after receiving a start signal and control heating power, heating time, etc. of

the heating assembly 100.

[0100] The power supply assembly 230 is connected to the heating assembly 100 for supplying power to the heating assembly 100. In an embodiment, the power supply assembly 230 may specifically include a rechargeable lithium-ion battery.

[0101] The aerosol-generating device 200 provided in the present embodiment is provided with the heating assembly 100. The heating assembly 100 is provided with the first connecting portion 121 for connecting to the positive electrode lead and a second connecting portion 131 for connecting to the negative electrode lead. The first connecting portion 121 and second connecting portion 131 are arranged at the same end on the outer surface 110a of the heating element 110, such that the positive electrode lead and the negative electrode may be connected at the same end of the heating element 110, without the need for the positive electrode lead or the negative electrode lead to be further wired to the other end to connect with the corresponding electrode. Compared with the solution of arranging the first connecting portion 121 and the second connecting portion 131 at the opposite ends of the outer side wall of the heating element 110, causing the positive electrode lead and the negative electrode lead need to be connected at both ends, it greatly simplifies the wiring path of the wires, reduces the length of the wires, and effectively reduces the production cost and difficulty.

[0102] The above are only embodiments of the present disclosure, and do not limit the patent scope of the present disclosure. Any equivalent structure or equivalent process transformation made using the contents of the description and drawings of the present disclosure, or directly or indirectly applied in other related technical fields, are similarly included in the patent protection scope of the present disclosure.

Claims

1. A heating assembly, comprising:

- a heating element, configured to receive an aerosol-forming substrate and heat the aerosol-forming substrate when energized;
- a conductive first electrode, arranged on an inner surface of the heating element, wherein the first electrode comprises a first connecting portion; and
- a conductive second electrode, spaced apart from the first electrode and arranged on the inner surface of the heating element, wherein the second electrode comprises a second connecting portion, and the first connecting portion and the second connecting portion are located at the same end of the heating element and configured to connect to a power supply assembly.

2. The heating assembly according to claim 1, wherein the heating element comprises:

a base, having a receiving cavity with an opening at one end, wherein the receiving cavity is configured to receive the aerosol-forming substrate from the opening, and the first electrode and the second electrode are both arranged on the inner surface of the receiving cavity; and an infrared heating layer, arranged on an inner surface of the base and connected to the first electrode and the second electrode respectively, wherein the infrared heating layer is configured to emit infrared waves when energized to heat the aerosol-forming substrate.

3. The heating assembly according to claim 2, wherein the heating assembly further comprises an infrared reflective layer, and the infrared reflective layer is disposed on an outer surface of the base for reflecting infrared rays emitted by the infrared heating layer.

4. The heating assembly according to claim 1, wherein the heating element comprises a plurality of sub-heating bodies, and an inner surface of each sub-heating element is provided with a first sub-connecting portion and/or a second sub-connecting portion, the first sub-connecting portions on the plurality of sub-heating bodies form the first connecting portion, and the second sub-connecting portions on the plurality of sub-heating bodies form the second connecting portion.

5. The heating assembly according to claim 4, wherein the first sub-connecting portion and the second sub-connecting portion are arranged on the inner surface of each sub-heating element, and the first sub-connecting portion and the second sub-connecting portion of the same sub-heating element are electrically connected to the infrared heating layer of the sub-heating element through extending parts respectively, such that the infrared heating layer of each sub-heating element is able to work independently.

6. The heating assembly according to claim 4, wherein the heating element comprises a first sub-heating element and a second sub-heating element, and each of an inner surface of the first sub-heating element and an inner surface of the second sub-heating element is provided with the first sub-connecting portion, the second sub-connecting portion, a first extending part and two second sub-extending parts, the two second sub-extending parts oppositely arranged at the first sub-heating element and the second sub-heating element form a second extending part, and a heating area is formed between the adjacent first extending part and the second sub-ex-

tending part, such that each of the first sub-heating element and the second heating element is able to heat the aerosol-generating substrate when energized.

7. The heating assembly according to claim 6, wherein each of the inner surface of the first sub-heating element and the inner surface of the second sub-heating element is provided with a third sub-connecting portion, and the third sub-connecting portion connects the two second sub-extending parts of the same sub-heating element.

8. The heating assembly of claim 4, further comprising:

a first conductive elastic piece, disposed on the inner surface of the heating element and electrically connected to the first sub-connecting portion on each sub-heating element; and/or a second conductive elastic piece, disposed on the inner surface of the heating element and electrically connected to the second sub-connecting portion on each sub-heating element.

9. The heating assembly according to claim 4, further comprising a fixing mechanism sleeved on the outer side wall of the heating element for fixing the plurality of sub-heating bodies to form the heating element.

10. The heating assembly of claim 9, wherein the fixing mechanism comprises:

a first fixing member, sleeved on first ends of the plurality of heating bodies and configured to fix the first ends of the plurality of sub-heating bodies; and a second fixing member, sleeved on second ends of the plurality of sub-heating bodies, and configured to fix the second ends of the plurality of sub-heating bodies.

11. The heating assembly according to claim 1, wherein the first connecting portion extends along the circumferential direction of the heating element and has a notch.

12. The heating assembly according to claim 11, wherein the second connecting portion is located at the notch and the height of the second connecting portion along the axial direction of the heating element is consistent with the height of the first connecting portion.

13. The heating assembly according to claim 1, wherein the heating element has a first end and a second end opposite to each other, and the first connecting portion and the second connecting portion are both arranged at the first end of the heating element; the

first electrode further comprises at least one first extending part connected to the first connecting portion, the first extending part extends from the first connecting portion toward the second end of the heating element; the second electrode further comprises at least one second extending part connected to the second connecting portion, the second extending part extends from the second connecting portion toward the second end of the heating element, and a heating area is formed between the adjacent first extending part and the second extending part.

14. The heating assembly according to claim 13, wherein the first extending part and/or the second extending part extend along the axial direction of the heating element and are linear.
15. The heating assembly according to claim 14, wherein one first extending part and one second extending part are spaced apart, or a plurality of first extending parts and a plurality of second extending parts are alternately spaced apart, so as to divide the heating element to form an even number of heating areas.
16. The heating assembly according to claim 14, wherein the distance between any adjacent first extending part and the second extending part is the same.
17. The heating assembly according to claim 14, wherein the second electrode further comprises a third connecting portion for connecting with a negative electrode lead, and the third connecting portion is arranged at the second end of the heating element and connected to the at least one second extending part.
18. The heating assembly according to claim 13, wherein the first extending part and the second extending part extend along the circumferential direction of the heating element and are in the spiral shape; and the heating area is located on one first extending part and one second extending part and is in the spiral shape.
19. The heating assembly according to claim 18, wherein extending directions of the first extending part and the second extending part are consistent.
20. The heating assembly according to claim 2, wherein both of the first connecting portion and the second connecting portion are spaced apart from the infrared heating layer of the heating element.
21. The heating assembly according to claim 2, wherein the heating element further comprises a limiting member, the limiting member is arranged at the base, the limiting member is configured to limit the aerosol-forming substrate, so as to form a gap between an outer surface of the aerosol-forming sub-

strate and an inner surface of the receiving cavity; the limiting member defines a limiting opening, and the limiting opening is in communication with the receiving cavity, the diameter of the limiting opening is smaller than the inner diameter of the receiving cavity; and the aerosol-forming substrate is received in the receiving cavity through the limiting opening.

22. An aerosol generating device, comprising:

a heating assembly, configured to heat an aerosol-generating substrate when energized; wherein the heating assembly is the heating assembly according to claim 1; and a power supply assembly, electrically connected to the heating assembly and configured to supply power to the heating assembly.

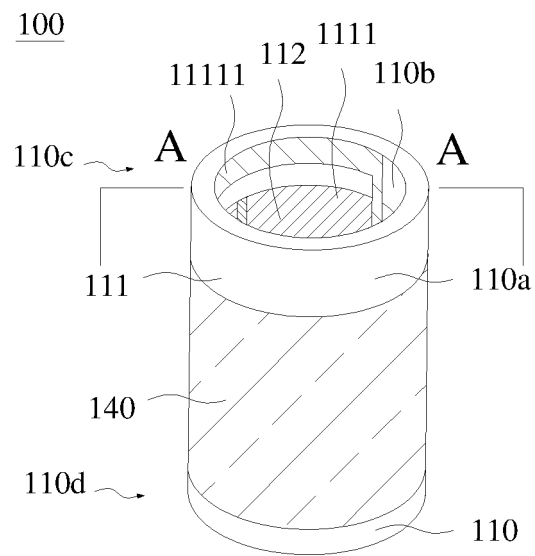


FIG. 1

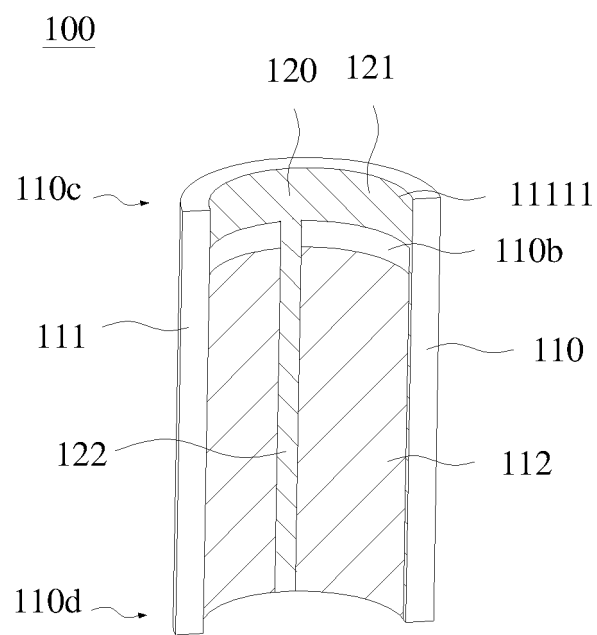
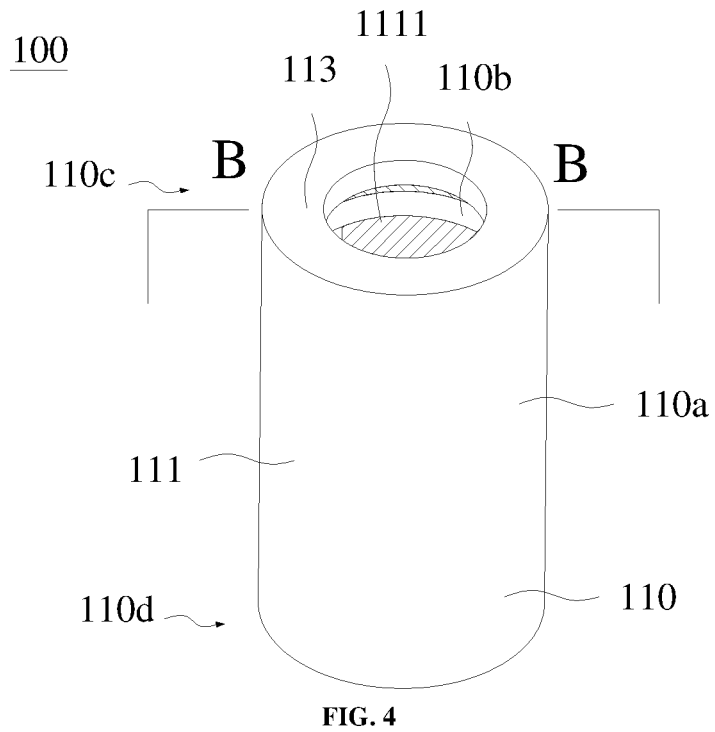
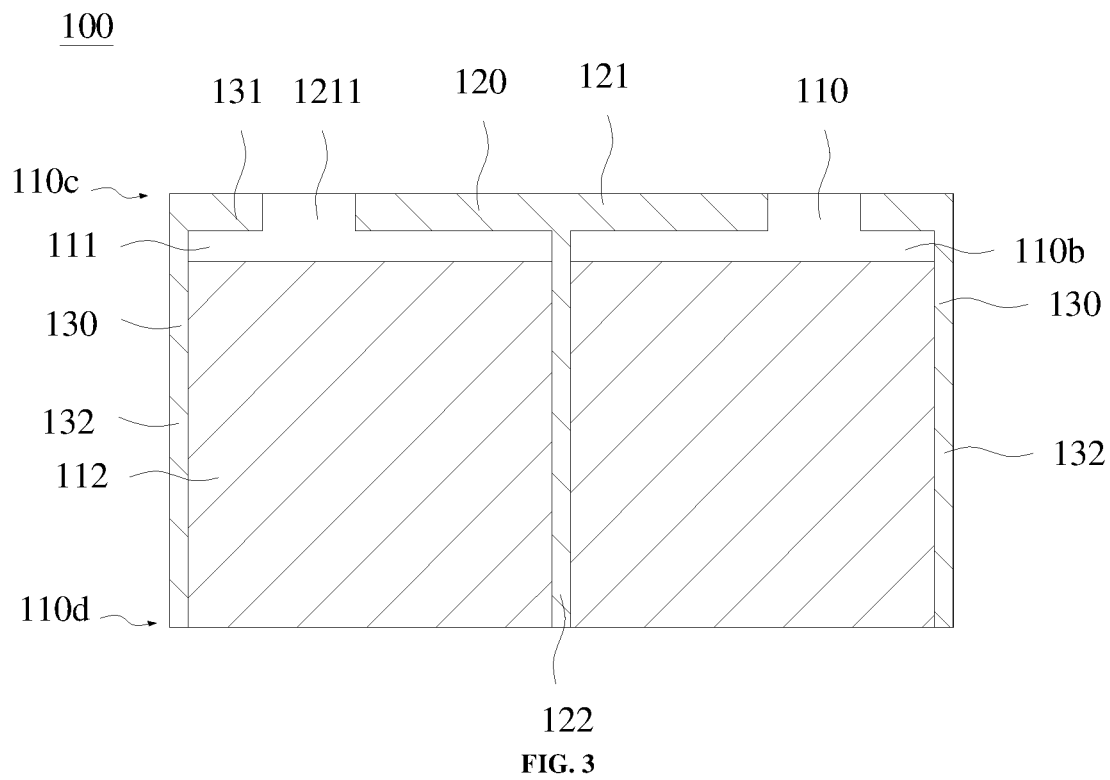


FIG. 2



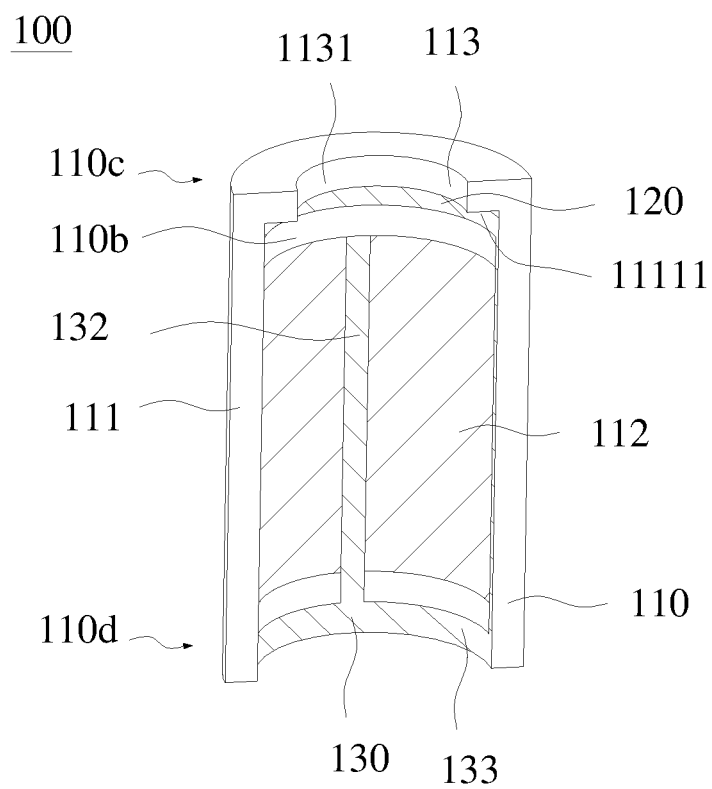


FIG. 5

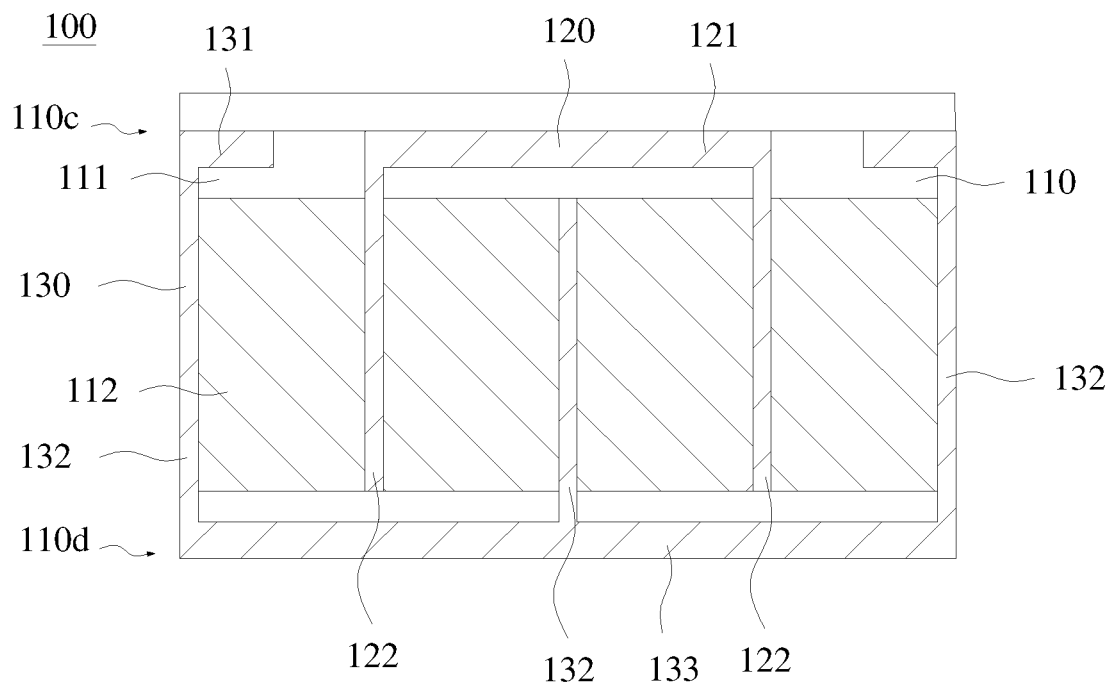


FIG. 6

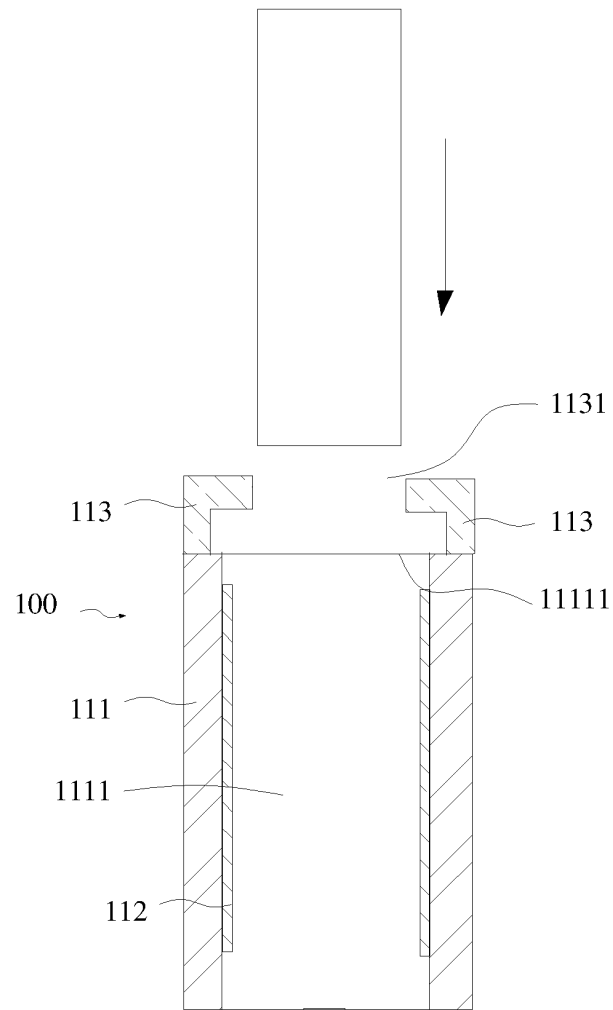


FIG. 7

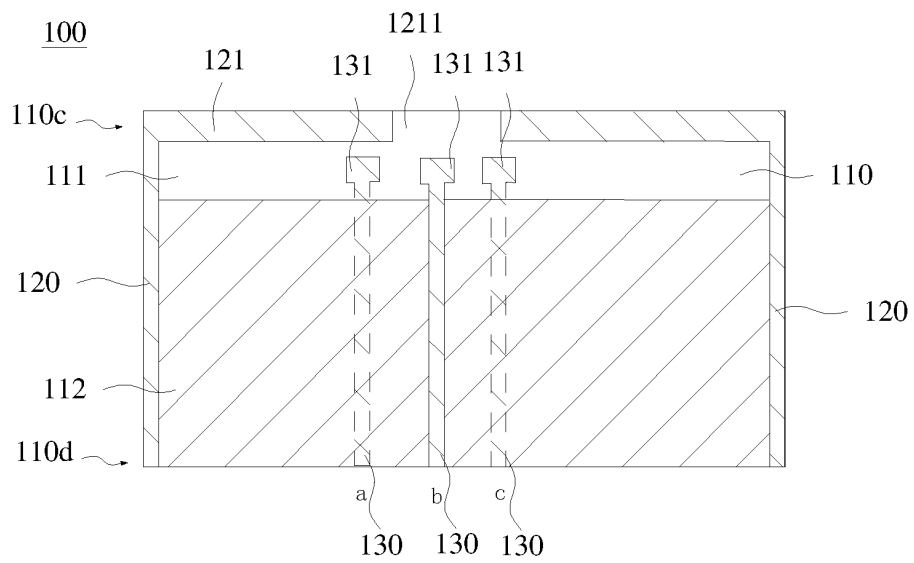


FIG. 8

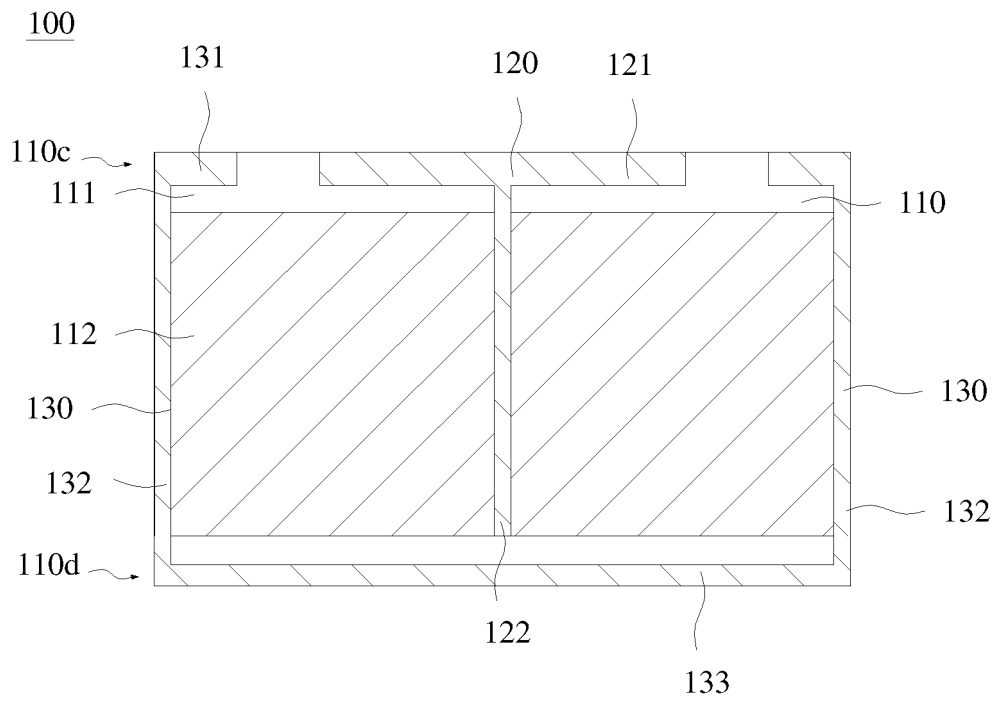


FIG. 9

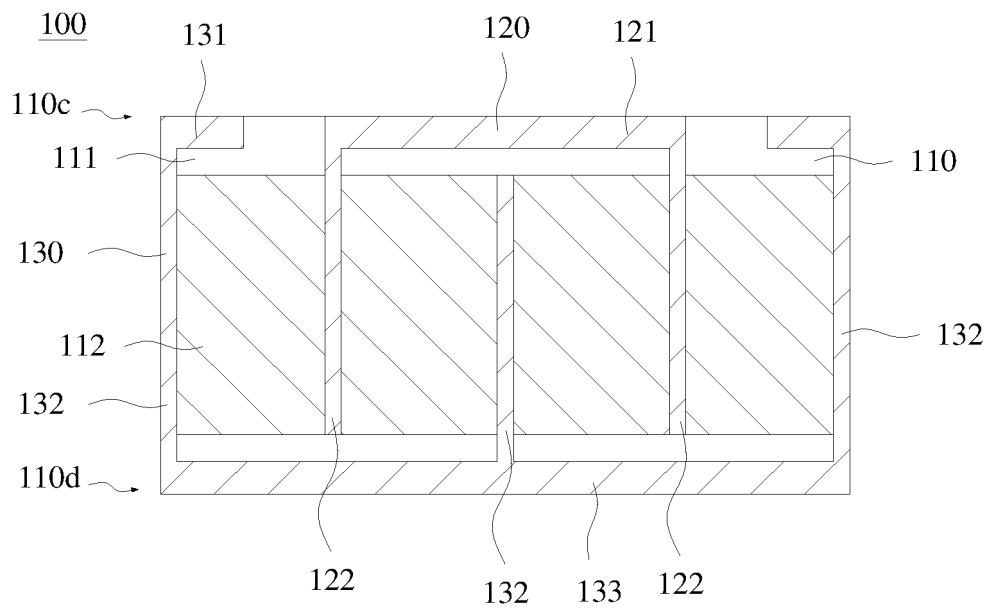


FIG. 10

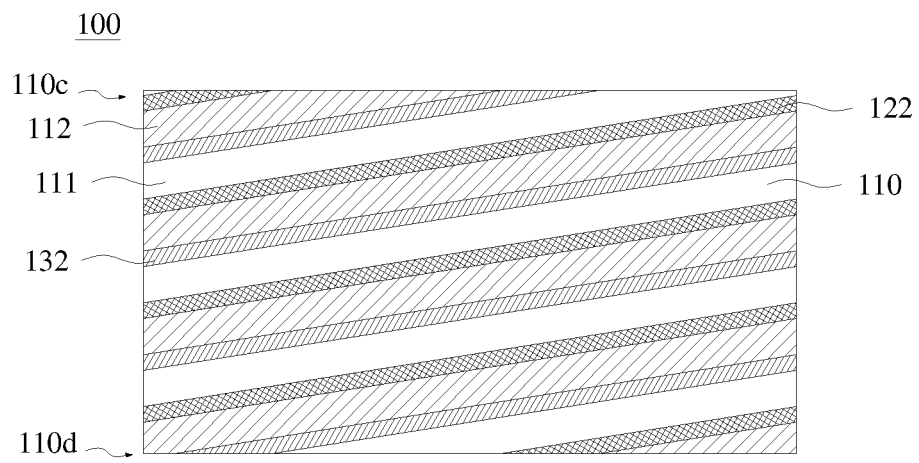


FIG. 11

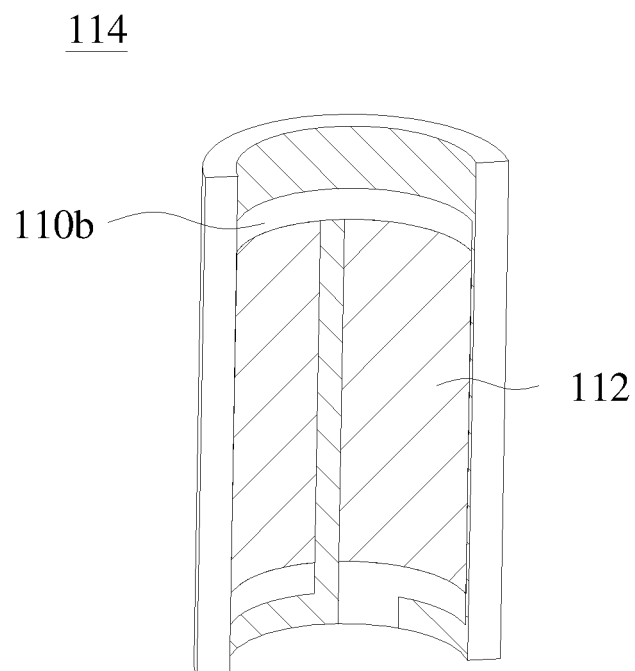


FIG. 12

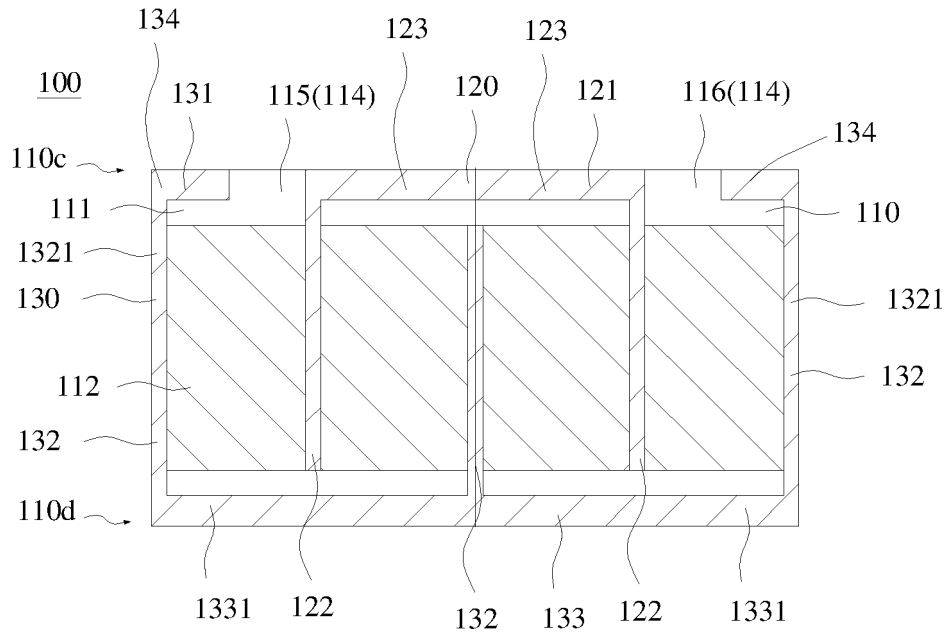


FIG. 13

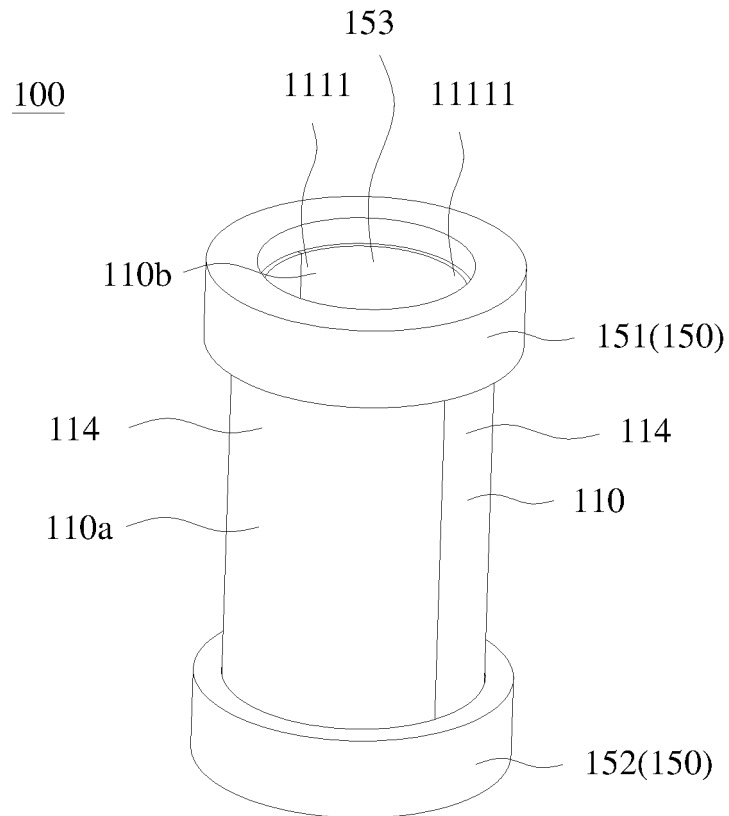


FIG. 14

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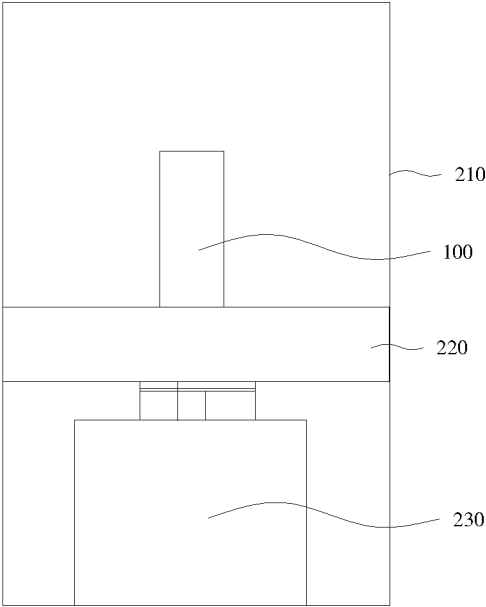


FIG. 15

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/100154

A. CLASSIFICATION OF SUBJECT MATTER A24F 40/46(2020.01)i; A24F 40/40(2020.01)i; A24F 40/20(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) A24F 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; VEN; WPABSC; ENTXT; USTXT; EPTXT; JPTXT; CNKI: 深圳麦时科技有限公司, 电子烟, 加热, 发热, 电热, 红外, 电极, 交叉, 指插, 插指, 梳状, 同一端, 供电, 电源, heat+, aerosol, conductive electrode, same end, connecting part																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT																		
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>PX</td> <td>CN 113647692 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 16 November 2021 (2021-11-16) claims 1-22, description, paragraphs [0001]-[0116], and figures 1-15</td> <td>1-22</td> </tr> <tr> <td>X</td> <td>CN 213604400 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 06 July 2021 (2021-07-06) description, paragraphs [0028]-[0047], and figures 1-5</td> <td>1-22</td> </tr> <tr> <td>A</td> <td>CN 212279881 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 05 January 2021 (2021-01-05) entire document</td> <td>1-22</td> </tr> <tr> <td>A</td> <td>CN 112841740 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 28 May 2021 (2021-05-28) entire document</td> <td>1-22</td> </tr> <tr> <td>A</td> <td>CN 113080520 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 09 July 2021 (2021-07-09) entire document</td> <td>1-22</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	PX	CN 113647692 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 16 November 2021 (2021-11-16) claims 1-22, description, paragraphs [0001]-[0116], and figures 1-15	1-22	X	CN 213604400 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 06 July 2021 (2021-07-06) description, paragraphs [0028]-[0047], and figures 1-5	1-22	A	CN 212279881 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 05 January 2021 (2021-01-05) entire document	1-22	A	CN 112841740 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 28 May 2021 (2021-05-28) entire document	1-22	A	CN 113080520 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 09 July 2021 (2021-07-09) entire document	1-22
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Date of the actual completion of the international search 26 August 2022	Date of mailing of the international search report 02 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.																	

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/100154

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
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		WO 2021129679 A1	01 July 2021

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